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ABSTRACT

This publication is the first of a three volume set summarizing the Energy Advisory Service operated by the New York Institute of Technology. The project reported here was an information dissemination service on energy conservation techniques in the New York, New Jersey and Connecticut area. The Energy Information Center, Energy Referral Service, Energy Hot Line, and Energy Management Seminar program are described and evaluated in this volume. Case studies of the referral service/hot line complex and the seminar program are presented as are an overall program evaluation and a recommendations section. Intended audiences of this report are groups considering energy outreach programs and those interested in evaluation research and policy analysis. (MR)

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HOW TO OPERATE AN ENERGY ADVISORY SERVICE

Volume I. Report and Recommendations

FINAL REPORT

June 1978

Prepared For
U.S. DEPARTMENT OF ENERGY
Assistant Secretary for Conservation
and Solar Applications
Division of Buildings and Community Systems

Under Contract No. EY-76-S-02-2977

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Volume I. Report and Recommendations

FINAL REPORT

June 1978

Prepared by
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New York Institute of Technology
Old Westbury, New York

For
U.S. DEPARTMENT OF ENERGY
Assistant Secretary for Conservation
and Solar Applications
Division of Buildings and Community Systems
Washington, DC 20545

Under Contract No. EY-76-S-02-2977

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EXECUTIVE SUMMARY

An experimental Energy Advisory Service was created and operated by the New York Institute of Technology to test the effectiveness of various channels of communication in the dissemination of energy conservation information and technical assistance to homeowners, architects, engineers, builders, contractors, business persons, public officials and the media.

A telephone Hot Line, a comprehensive Energy Information Center, and a broad gauge Referral Service were operated as a unified complex and serviced more than 5,000 Hot Line inquiries from homeowners (67%) and others (33%). More than half the homeowners who called the Hot Line then spent an average of $1,280 each to retrofit their homes on the basis of information learned. Approximately 487 professionals and others used the information and research services of the Energy Information Center, in addition to those using the Hot Line. Overall benefit/cost ratio was greater than 11:1.

An innovative Interactive Television Seminar series serviced 2,200 professionals directly and indirectly with videotaped material and live discussion on all aspects of energy conservation, at a cost of $32.00 per participant.

Follow-up surveys indicated that the large majority of all users believed the Energy Advisory Service was valuable, reliable and unique as a comprehensive, easily accessible source of information and technical assistance on energy conservation and alternative energy systems.

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INTRODUCTION

Under contract EY-76-S-02-2977.A002 with the U.S. Department of Energy (formerly the U.S. Energy Research and Development Administration), the Center for Energy Policy and Research of the New York Institute of Technology has organized and conducted an ENERGY ADVISORY SERVICE for information dissemination on energy conservation techniques to various target audiences in the New York, New Jersey and Connecticut area. The information disseminated went far beyond the lowering of thermostats, putting out lights and driving at 55 miles per hour. It dealt with the application of a variety of economically viable, presently available technologies, both new and old, simple and sophisticated, to use energy more efficiently, and to substitute renewable energy sources for non-renewable sources. Current consensus agrees that if these presently available technologies were more widely employed, consumption of energy in this country could be reduced significantly without adverse effect on our high standard of living or our economic growth.

In anticipation of the establishment of the National Energy Extension Service program, the NYIT ENERGY ADVISORY SERVICE was an experiment in energy conservation outreach, using extensive telephone, printed, audio-visual and two-way television communications. These activities were designed to help overcome recognized barriers preventing a wide adoption of energy conservation technology. These barriers include the lack of *knowledge* about energy conservation possibilities on the part of consumers, homeowners, small business and industry managers, public officials, legislators, city managers, architects, contractors and the public as a whole; and beyond the general lack of knowledge, the lack of *specific information and technical assistance* needed for the retrofitting of homes, the installation of energy management programs in commercial and public institutions, the acquisition, financing and installation of solar energy systems, the design and construction of new buildings embodying energy conserving principles and the evaluation of alternative consumer products in terms of lifetime operating costs.

In this report we try to convey a sense of what happened in the Energy Advisory Service as far as we were able to observe, formally evaluate and interpret. We have also included recommendations which summarize our best judgments acquired from practical experience in operating the NYIT ENERGY ADVISORY SERVICE for twenty-one months.

The principal audiences for this report are the many groups considering the establishment of their own energy outreach programs, including all of the states who will participate in the new Federal-State Energy Extension Service. A secondary audience includes the policy analysts studying the burgeoning field of evaluation research.

During the first ten months of the contract (June 1, 1976 to March 31, 1977), we successfully completed the establishment and initial testing of four channels of communication--Energy Information Center, Energy Referral Service, Energy Hot Line and Energy Management Seminar program--all in accordance with the detailed NYIT Energy Advisory Service Implementation Plan, August 26, 1976 and with the ERDA Statement of Work for the initial period, reproduced in the Appendix.

During the subsequent eleven months of the contract (April 1, 1977 to February 28, 1978), we continued to operate the existing channels of communication described in the NYIT Energy Advisory Service Revised Project Extension Proposal, May 1, 1977 and we have prepared reports, herein submitted, pertaining to overall program evaluation, case studies of individual program elements and comparative analysis of various channels examining energy technology transfer effectiveness all in accordance with the ERDA Statement of Work for the extended period, reproduced in the Appendix.

In the course of executing this twenty-one month experimental program we have reached three principal conclusions:

1. A well designed and operated Energy Information Center/Referral Service/Hot Line complex can promote extensive investment by homeowners in energy conservation systems, equipment, materials and services, and can promote extensive changes on the part of professional and technical leaders in work-associated energy conservation practices and attitudes.

2. An innovative type of Energy Management Seminar program for professionals, utilizing an appropriate combination of live and videotaped material in an interactive television format, can reach large audiences of decision-makers for the effective transfer of energy technology at very moderate cost.

3. The Energy Advisory Service program as executed has served the multiple purpose of facilitating energy conservation among private citizens thereby stimulating the economy, and developing a momentum towards conservation among professionals and decision-makers which can have a multiplier effect on future energy conservation by the general public.

About This Report

Volume One of this report is organized into six sections as follows:

Section One--The NYIT Energy Advisory Service: Program Summary

Section Two--Case Study: The NYIT Energy Information Center/Referral Service/Hot Line Complex

Section Three--Case Study: The Energy Management Seminar Program

Section Four--Comparative Analysis: The New York Tech Energy Hot Line and June 1977 NYIT/ERDA Interactive Television Energy Management Seminar Series

Section Five--Overall Program Evaluation

Section Six--Formal Recommendations

Section One will describe the Energy Advisory Service by summarizing program objectives, target geographic area, target audiences, energy technologies and related topics selected for information dissemination, staffing, and major program milestones.

The Case Studies presented in Sections Two and Three will each be organized into two parts. Part A will discuss a particular outreach program in terms of the process of establishing and developing program resources, operating procedures, staffing needs, publicity activities, and operating statistics. Part B will present evaluation data pertaining to the performance of the program as an outreach activity and the impact of the program measured according to specific criteria, including numbers of persons reached, numbers taking action, estimated energy and dollar savings and a cost-to-savings ratio.

Section Four will present data emerging from a study designed to investigate the New York Tech Energy Hot Line and the June 1977 interactive television Energy Management Seminar series for their comparative effectiveness in energy technology transfer.

Section Five will detail overall program performance including managerial, procedural and costing considerations and will present general observations on the design and implementation of a national Energy Extension Service based on our operating experiences.

Section Six will present formal recommendations.

Illustrative material on various aspects of the Energy Advisory Service will be included in separate volumes of this report as follows:

Volume II: NYIT Energy Information Center and Referral Service Resource Material

Volume III: New York Tech Energy Hot Line Resource Material

SECTION ONE

THE NYIT ENERGY ADVISORY SERVICE: PROGRAM SUMMARY

Objectives

From an overall point of view, the Energy Advisory Service has had two sets of objectives -- one involving information outreach activities and the second involving program evaluation activities. The general information *outreach objectives* of the Service were:

1. To provide managers of small industrial and commercial enterprises with the knowledge and technical assistance required to adopt energy conserving programs and practices.

2. To provide homeowners and the general public with the knowledge and assistance needed to implement energy conserving measures.

3. To provide public officials and private sector decision-makers with the information needed to plan and implement programs which will encourage and facilitate energy conservation throughout the community.

The program *evaluation objectives* of the Service were:

1. To evaluate the effectiveness of the various channels of communication used to disseminate information to target audiences by means of case study and comparative methodologies.

2. To evaluate the overall program considering management structure and procedures: staffing needs, budget and training; and cost/benefit analysis.

3. To evaluate and present all of the above with the view towards making recommendations to the U.S. Department of Energy on the design and implementation of a national energy extension service.

Program Elements

The major program elements designed to accomplish these two sets of objectives are described in detail below and include the NYIT Energy Information Center/Referral Service/Hot Line complex and the Energy Management Seminar Program.

Geographic Area

Geographic areas in which these programs were publicized and offered include ten adjacent counties in the New York, New Jersey and Connecticut area, although requests for information and technical assistance were accepted from other areas. As shown in the Illustration below, the counties were:

New York	New Jersey	Connecticut
Nassau	Bergen	Fairfield
Suffolk	Essex	
Queens	Hudson	
Westchester	Middlesex	
Rockland		

Target Audiences

Target audiences selected for Energy Advisory Service programs included:

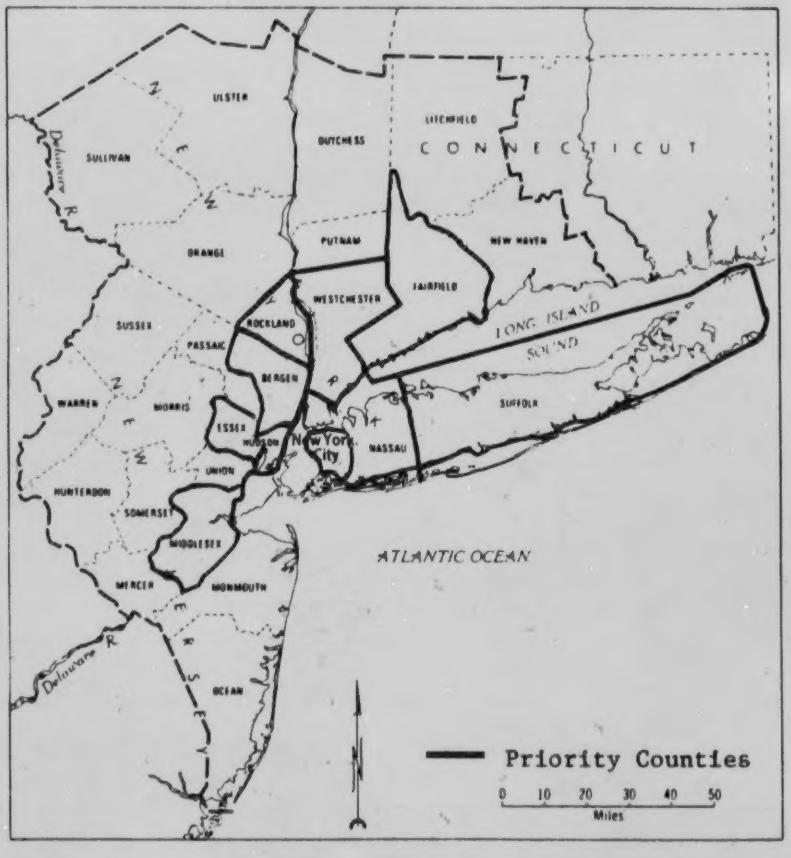
Category 1. Owners/Managers of small industrial and commercial enterprises.

Category 2. Energy Influential Industries which, by their pricing and practices, determine the attractiveness of energy conserving equipment and techniques -- e.g., builders/contractors, real estate developers, architects, equipment manufacturers, and industrial engineers.

Category 3. Owners/Managers of single family homes, multi-family buildings, public institutions (schools, hospitals, libraries, etc.), and government buildings.

Category 4. Participants in the Energy Policy-Making Process, broadly defined to include individuals with the authority to set energy policies (e.g., public executives, legislators, planning officials, and members of school boards, hospital boards, zoning boards, and public utility commissions), ILLUSTRATION

GEOGRAPHICAL AREA COVERED



individuals with the authority to execute energy policy decisions (e.g., energy conservation officials and building inspectors), individuals in a position to provide expert assistance in public policy formulation (e.g., officials of financial institutions, trade and professional associations and unions), and individuals, who by their interest and activity, provide impetus for energy policy changes (e.g., media personnel and the general public).

Energy Topics Disseminated

Energy technologies and related topics selected for information dissemination included (1) opportunities for energy conservation through modified operational procedures, retrofitting, and new design, (2) solar, wind, biomass, geothermal, and solid waste energy conversion techniques, and local generation of electricity in total energy systems, (3) the heat pump and storage technologies for heat and electric energy, (4) the economic pay-off of energy conservation practices and energy conserving equipment, (5) the availability, sources, and cost of capital needed for the purchase and installation of energy conserving equipment, (6) the energy audit and its preparation, (7) the specifications, costs, and vendors of energy conserving equipment, (8) private companies involved in the design and installation of energy management systems, (9) energy conserving equipment test performance data, (10) case studies of economic savings through the installation of energy conserving equipment, (11) energy policy and trends on all governmental levels, (12) the social/environmental/economic impact of energy conservation, (13) the attitudinal barriers to energy conservation, (14) data on energy utilization by industry, by industrial process, by region of the country, etc., (15) energy conservation practices abroad.

Staff

The staff included the Director, Deputy Director, Associate Director for Information Services, Associate Director for Technical Programs, Manager of Student Liaison, Community Relations specialist and Assistant Librarian. Other personnel associated with the program were Staff Associates drawn from the New York Institute of Technology faculty, paraprofessionals including volunteers and students, and a Policy Advisory Council. (See page 101, for staff details.)

Program Milestones

Since the start of the initial contract period, the Center for Energy Policy and Research has organized a prototype Energy Advisory Service and has developed and conducted a variety of energy information outreach programs thoughout the metropolitan New York, New Jersey and Connecticut area. A summary of major milestones follows:

--Organized and staffed the NYIT Energy Advisory Service

--Prepared and delivered NYIT Energy Advisory Service Implementation Plan, August 26, 1976, to provide detailed description of the proposed program including technical services, target audiences, technologies, and combinations of these elements to be field-tested as well as management, staffing, evaluation and documentation procedures. The NYIT Energy Advisory Service Implementation Plan was distributed to the Governors of the fifty States to serve as a basis for the establishment of state-wide energy extension services under the National Energy Extension Service program (see, Selected Reports: Energy Extension Service, Energy Research and Development Administration/Technical Information Center/ Oak Ridge, Tennessee, April, 1977).

--Established the NYIT Energy Information Center/Referral Service/Hot Line complex to provide immediate, accurate and practical information on energy conservation and related matters to 5,876 homeowners, consumers, architects, engineers, builders, contractors, real estate developers, facility operators, bankers, public officials, educators, and the media.

The NYIT Energy Information Center has comprehensive printed and microform resources on all aspects of energy conservation and related subjects, as well as computerized access to major national data bases and to the DOE Technical Information Center in Oak Ridge, Tennessee. Directly handled 487 requests for information from business and public officials, academic institutions, students, professionals and the media.

The tri-state Energy Referral Service consists of 4,601 cooperating organizations, public and private, to whom we refer people who seek information or services beyond the purview of the Energy Advisory Service. Designed a computer program to store and selectively generate names of organizations on the referral roster. Handled 1,626 referrals and provided a selected referral list and bibliography to some 2,000 professionals invited to or attending Winter 1976 NYIT/ERDA Energy Management Seminars.

The New York Tech Energy Hot Line provides immediate telephone access to the Information Center, Referral Service and the technical assistance capabilities of the Center. Prepared 442 Questions and Answers, assembled quantities of 104 different pamphlets for use in mailings, developed 40 special information packets for the same purpose, trained 53 paraprofessional operators, and handled 5,389 inquiries, including 1,823 arising in conjunction with our participation at various energy fairs. Upon request of the Energy Policy and Planning unit in the Executive Office of the President of the United States, provided the White House with a complete duplicate of the New York Tech Energy Hot Line telephone station including our special operator's carousel containing hundreds of basic questions and answers on energy, copies of informational material mailed to callers, and Hot Line Operating Instructions.

--Organized the November/December '76 and June '77 NYIT/ERDA Energy Management interactive television Seminar series. Produced several hours of full color, illustrated professional quality videotaped interviews with experts on solar energy applications, energy conserving building design, energy management systems, energy conservation financing, energy legislation and ASHRAE Standards for energy conservation. Conducted 5 days of live/videotape seminars in winter, 1976 and 3 days of live/videotape seminars in June, 1977 over the 9-county interactive TV network of the Metropolitan Regional Council. Participating audience totaled approximately 1,000 architects, builders, engineers, bankers, business persons, and public officials from all levels of government.

As a by-product of the Energy Management Seminar Program, produced an edited 55 minute video program entitled Solar Energy Today and an edited 25 minute video program entitled Energy Conservation in Residential Construction for general distribution over cable and open-circuit television and in 3/4 inch professional video cassette form. Provided copies of the presentations to 61 organizations upon request for showings before an estimated audience of 1,200.

Therefore reached approximately 2,200 professionals with videotaped materials developed for the Energy Management Seminar Program.

--Prepared an invited paper entitled "WE CAN SOLVE THE ENERGY CRISIS: The Transfer of Energy Conservation Technology" and presented it before the 1976 Summer Workshop on Energy Extension Services at the University of California at Berkeley.

--Developed a publicity program on the various activities of the NYIT Energy Advisory Service which producted special articles in the N. Y. SUNDAY NEWS, the N. Y. TIMES and NEWSDAY, and references to the NYIT Energy Advisory Service in general energy stories in newspapers and in various public newsletters and other publications throughout the country.

--Provided information, technical assistance, speakers, printed materials, and conference participants for 72 public and private organizations concerned with energy conservation.

--For purposes of experimentation, trained volunteers to assist 31 area homeowners in the completion of the Home Energy Saver's Workbook (FEA/D-76/362) to determine what measures will make a particular home more energy efficient and what the homeowner can expect to save in home heating and cooling costs by taking these measures.

--Prepared and delivered NYIT Energy Advisory Service Preliminary Project Assessment, June 1 to December 30, 1976 to report our initial experiences in establishing four communication channels and to make recommendations for future channel implementation dictated by our experience through 1976.

--Prepared and delivered NYIT Energy Advisory Service Initial Evaluation Report, January 31, 1977 to present statistical results and inferences from a preliminary study analyzing the NYIT Energy Hot Line and the Winter '76 NYIT/ERDA (MRC-TV) Energy Management Seminar program for their absolute and comparative effectiveness in energy technology transfer. NYIT Energy Advisory Service Initial Evaluation Report was distributed to the Governors of the fifty states to serve as a basis for the establishment of state-wide energy extension services under the National Energy Extension Service program. (See Selected Reports: Energy Extension Service and Case Studies and Other Materials: Energy Extension Service, Energy Research and Development Administration/Technical Information Center/Oak Ridge, Tennessee, April 1977.)

--At the invitation of the National Energy Extension Service, participated in the EES Orientation Session, September 16, 1977 and the EES Directors meeting, January 12, 1978 to assist Alabama, Connecticut, Michigan, New Mexico, Pennsylvania, Texas, Tennessee, Washington, Wisconsin and Wyoming in setting up demonstration outreach projects including telephone Hot Lines preparatory to the establishment of a nationwide state-run energy information network under EES auspices.

--At the request of the National Energy Extension Service, provided the Directors of the ten EES demonstration programs with complete duplicates of the New York Tech Energy Hot Line questions and answers, informational materials mailed to each caller, and manuals detailing operating instructions.

--At their request, provided 78 energy planners from state, county, and local governmental agencies and from universities and planning commissions across the country and abroad with detailed information pertaining to various aspects of the NYIT Energy Advisory Service to assist in implementation of similar programs elsewhere.

--Organized a Policy Advisory Council consisting of influential representatives of the economic, political and social sectors of the tri-state area, chosen for their ability to enhance the programs of the Center in general and the information outreach programs in particular. (See list of Council members, page 105).

SECTION TWO

CASE STUDY: THE NYIT ENERGY INFORMATION CENTER/REFERRAL SERVICE/HOT LINE COMPLEX

Part A

Introduction

The NYIT Energy Information Center, the NYIT Energy Referral Service and the New York Tech Energy Hot Line are three channels of communication which function together as one complex to provide immediate, accurate and practical information on energy conservation and related matters to homeowners, consumers, architects, engineers, builders, contractors, real estate developers, business persons, facility operators, bankers, public officials, educators and the media. For most homeowners and consumers and some professionals, energy conservation information is effectively disseminated by the New York Tech Energy Hot Line alone. But to be of serious value for many professionals and decision-makers who often require complex and highly technical information, the Hot Line is backed up (a) by the comprehensive, up-to-date NYIT Energy Information Center/Referral Service and (b) by a substantial professional staff knowledgeable in the various energy areas involved.

To date 5,876 requests for information and technical assistance have been handled by the Energy Information Center/Referral Service/Hot Line complex as follows:

> 487 directly by the Energy Information Center, including 156 involving the Referral Service mechanism, and 5,389 through the Hot Line including 3,306 arising over the telephones, 260 from letters, and 1,823 in conjunction with our participation at various energy fairs.

This section will begin by discussing the Energy Information Center and Referral Service in terms of the development of program resources, operating procedures, statistics, and staffing needs and responsibilities. It will conclude by providing a similar treatment for the New York Tech Energy Hot Line. Part B will contain results of an evaluation program in which the performance of the Energy Information Center/Referral Service/Hot Line complex was analyzed in terms of user satisfaction with the service and subsequent impact of the service on user's knowledge and action about energy conservation.

General Description: NYIT Energy Information Center and Referral Service

The NYIT Energy Information Center is a facility where research can be conducted on all aspects of energy conservation and related matters and where materials can be found to plan, prepare and implement energy conservation outreach activities.

The Information Center provides an up-to-date, comprehensive information service covering every aspect of energy conservation and related technologies including conservation programs and practices, alternative energy systems, energy legislation and public policy development in the United States and abroad. Books, periodicals and other reference and printed material are available through an author-title-subject card catalog system classified according to headings established by the Library of Congress. Pamphlets, news clips, public and private reports, audio-visual presentations (films, videotapes, slide/tape shows, slide shows) and other ephemeral materials are organized in a Vertical File System which has its own Thesaurus of Descriptors for easy access. The Energy Information Center, through its TECHSEARCH facility, provides direct computer printouts of bibliographies and abstracts from the U. S. Department of Energy Technical Information Center at Oak Ridge, the National Technical Information Service, the Educational Resources Information Center and other major national data bases.

In addition to these information resources, the Energy Information Center maintains the NYIT Energy Referral Service roster so that requests for information or technical assistance which go beyond funded scope can be referred to an appropriate organization in user's area if one is available. At present more than 4,600 organizations have filed with the Referral Service, including private firms engaged in research, manufacture, distribution, servicing or financing of energy conservation products or alternative energy systems (including solar), and citizen-based non-profit and public bodies, functioning on all governmental levels, which have some degree of involvement in the energy conservation field.

Establishing the Energy Information Center and Referral Service

In establishing the Energy Information Center, initial policy decisions determined (i) the purposes of the Information Center in the Energy Advisory Service program and (ii) criteria for new acquisitions.

(i) Energy Information Center Purposes

The Energy Information Center was designed at once to provide the Center for Energy Policy and Research with materials needed to plan and implement various energy conservation and outreach activities including the Energy Hot Line, and to operate as an outreach channel in its own right to directly serve the often complex and technical informational needs of professionals including architects, engineers, builders, bankers, business persons, public officials, and the media.

As a backup to other energy conservation outreach programs, the Energy Information Center facilitates, for example, Energy Hot Line operations by providing materials needed to:

(a) identify likely Hot Line questions and prepare documented answers

(b) up-date indexed Hot Line Question and Answers cards

(c) prepare special information packets used in Hot Line mailings

(d) generate computerized lists of private concerns involved in the manufacture, distribution, installation, servicing and/or financing of energy conservation in response to specific requests for such information. (All such lists are imprinted with the following disclaimer: "This list in no way represents or constitutes an endorsement, recommendation, or favoring by the Center for Energy Policy and Research or the U. S. Department of Energy of any specific company, product or service.")

(e) answer Hot Line questions in situations where indexed Question and Answer cards are not adequate.

Many of the Hot Line queries requiring Energy Information Center handling are posed by media persons, architects, engineers, public officials and other technical and professional leaders in the energy field. More usually, such technical and professional leaders -- who by their practices and activities have great impact on the course of conservation in this country -- enter the Energy Advisory Service system directly through the Energy Information Center.

To say that the Energy Information Center/Referral Service functions in its own right as an outreach channel of communication is to say that for such individuals the Energy Information Center directly offers one or more of the following services:

(a) conducting of original research to prepare written answers to specific complex and/or technical questions.

(b) preparation of individualized bibliographies of reading materials on specifically requested topics.

(c) initiation of a TECHSEARCH computer literature survey conducted according to a fee schedule established by the New York Institute of Technology.

(d) generation of specially-prepared lists of contacts or other referrals.

(ii) Criteria for New Acquisitions

Acquisition of new materials for the Energy Information Center is a continuous, balanced exercise directed towards building a collection which is comprehensive in areas covered. Each work considered for inclusion in the Center is judged according to the following criteria:

Merit

--The work makes a substantive contribution in content or point of view.

--It has permanent, timely, or potential value.

Collection Development

--The work fills a recognized gap.

--It expands upon, or rounds out available information on a particular subject.

Comprehension/Readability

--The work has clarity of style, is well-organized, is written on an appropriate level and/or is visually acceptable

Authoritativeness

--The work adheres to accepted standards for author, publisher, date of publication, and/or sources of data cited.

To locate materials meeting these criteria, staff members (a) periodically examine a number of reference tools including bibliographies, indexing and abstracting services and TECHSEARCH-generated literature surveys, (b) follow the publishing activities of public and private organizations known for their interest in and coverage of energy events, (c) solicit recommendations from other CEPR personnel, and (d) monitor daily newspapers and other periodicals.

Since inception of the Energy Information Center approximately 10,500 items have been acquired. To illustrate the scope and differing formats of these items, the 1977 *MIT Energy Information Center Selected Acquisition Lists*, which are issued monthly, are included in Volume II.

Energy Information Center Resources

The resources of the NYIT Energy Information Center include:

(i) Books and Reference Materials

(ii) Periodicals

(iii) Report literature

(iv) Pamphlets, News clips, Public and Private Reports, Audio-visual Presentations, and other Ephemeral Literature.

(v) Various indexing sources, including TECHSEARCH, an on-line computer search system.

(vi) NYIT Energy Referral Service Roster

(i) Books and Reference Materials

Energy Information Center books are classified according to the Library of Congress classification system and are arranged on shelves by call numbers. Almanacs, directories, handbooks, bibliographies and other reference materials are also catalogued and shelved for convenient retrieval when specific energy facts, figures, or other data are required.

(ii) Periodicals

The Energy Information Center has access to 312 periodicals of which 98 are available at the Center and 214 are available through the NYIT library. These include newspapers, newsletters, popular magazines, technical journals, bulletins and checklists issued with some regularity. Additions are continually processed. A list of those currently received is included in Volume II.

(iii) Report Literature

A major part of the collection consists of publications of (a) federal, state and local agencies, (b) quasi-governmental agencies, (c) non-profit groups, (d) legislative hearings, and (e) organizations under government contract. At the present time, approximately one-quarter of these documents are on microfiche and are accessible through the card catalogs as are those reports in hard copy.

(iv) Pamphlets, Newsclips, Public and Private Reports and Other Ephemeral Literature

The Energy Information Center has thousands of pamphlets, newsclips, public and private reports and other ephemeral literature arranged alphabetically by more than 400 subject categories (descriptors) in a Vertical File System. Literature of this sort--much of which will not appear for some time in book form--enhances not only the comprehensiveness of the Energy Information Center but enables it to be contemporary at all times. The Thesaurus of Descriptors is reproduced in Volume II.

(v) Indexing Sources (including TECHSEARCH)

With the escalation of publications in the professional fields germane to energy, computer search and retrieval systems play an increasingly important role. The NYIT Energy Information Center provides access to TECHSEARCH, a NYIT computer retrieval system. TECHSEARCH can locate--with thoroughness and electronic speed--a complete review of all printed materials on energy-related subjects available through various data banks maintained by the Lockheed Corporation (DIALOG), Systems Development Corporation (ORBIT) and U. S. Department of Energy Technical Information Center (RECON).

At present, TECHSEARCH has entry into more than 55 data bases. For example, some of the more popular data bases for energy fields are described below:

National Technical Information Service. NTIS data base derives from Weekly Government Abstracts and Government Reports Announcements published by the U. S. Department of Commerce and has the same coverage. Approximately 2,500 records are added bi-weekly to the on-line and off-line files which go back to 1964.

Computerized Engineering Index. COMPENDEX data base corresponding to the publication The Engineering Index Monthly is produced by Engineering Index, Inc. An average of 7,000 records are added each month. The on-line file goes back to 1970, the off-line file to 1969.

Chemical Abstracts. CA data base derives from Chemical Abstracts, sponsored by the American Chemical Society. About 6,000 articles selected from 10,000 journals are added each week. On-line file dates back to 1970.

ABI/INFORM. INFORM data base produced by ABI, Inc., is updated monthly at a rate of about 900 articles relevant to business research. On-line file goes back to August 1971.

Social Sciences Citation Index. SSCI data base is produced by the Institute of Scientific Information. Approximately 5,500 records are added monthly to the file that goes back to 1972.

Educational Resources Information Center. ERIC data base is maintained by the U. S. Office of Education. Each month about 1,000 new reports and 1,500 new journal articles are added to on-line and off-line files that date back to 1966.

Using the TECHSEARCH facility, files may be searched representing an enormous number of articles, reports, books, current and completed research projects and other kinds of information. The results of a TECHSEARCH run produce a bibliography that contains citations of each document available on a particular subject. A complete citation indicates a title, author, abstract, and the journal and/or other media in which the document appears, and the places in which it may be located. Complete citations for each located document can be displayed immediately on-line or in the case of long bibliographies, they may be completed on a high-speed printer and sent through the mails.

In addition to TECHSEARCH, the Energy Information Center maintains hard copies of other Indexing Sources including Energy Information Abstracts, Energy Abstract for Policy Analysis, and Solar Energy Update.

(vi) NYIT Energy Referral Service Roster

The Energy Information Center has established an Energy Referral Service roster that contains extensive files on the services of private firms and professional, trade and business associations involved with the manufacture, distribution, servicing, financing of, and research on energy conservation products or alternative energy systems, including solar, as well as files on the services of non-profit, citizen-based and public bodies, functioning on all governmental levels, which are involved in the conservation or alternative energy field.

To identify private firms for inclusion in the Referral Service roster, trade magazines, journals, catalogs, conference reports and newspapers were read. Once companies and products were identified, information for the Referral Service roster was gathered by sending survey form letters to various product manufacturers, distributers and installers, submitting "Send Me More Information" cards offered in various trade magazines, and directly telephoning home offices of major corporations.

To identify professional, business and trade associations, and non-profit, citizen-based and public bodies involved in energy conservation or alternative energy, Energy Information Center materials were read not only for content, but for "contact." Once identified, organizations were contacted either by letter or phone to ascertain specific interests and services.

To date, 4,601 organizations have registered with the Referral Service. Volume II of this report presents the basic structure of the Referral Service roster.

Accessing Energy Information Center Resources

Seven methods are available for locating Energy Information Center resources. Each are updated and revised periodically:

(i) author index

(ii) title index

(iii) subject index

(iv) TECHSEARCH and RECON Instruction Manuals

(v) Periodical Record book

(vi) Thesaurus of Descriptors

(vii) NYIT Energy Referral Service Computer Program

The author, title and subject indices are kept in a card catalog which uses Library of Congress call numbers.

Names of and publication data on all periodicals are presented on 3" X 5" record cards which are inserted into pockets in a Periodical book.

The TECHSEARCH and RECON Instruction Manuals provide trained personnel with detailed information to initiate a computer literature search.

The Thesaurus of Descriptors is the key to the pamphlets, newsclips, reprints, studies, audio-visual materials, announcements, and other ephemeral literature found in the Vertical File System. The Thesaurus contains a list of subject headings which were developed to organize Vertical File material, and which are based on the emerging vocabulary of the energy literature. Other nomenclature which may come to researcher's mind when seeking information on a specific energy-related topic is also included in the Thesaurus so that cross references can be made to actual Vertical File subject headings. Volume II contains the Thesaurus of Descriptors.

A computer program has been designed to store the names of organizations in the NYIT Energy Referral Service roster so that lists may be generated which contain the names, addresses, and telephone numbers of organizations which perform designated conservation activities in particular geographic locations. For example, the Referral Service computer program can be used to generate a list of companies which manufacture solar space heating antifreeze systems for homes or citizen-based organizations which are active in the application of wind power.

On-Going Energy Information Center/Referral Service Activities and Staffing Requirements

Obtaining and utilizing materials needed to plan and implement the energy conservation activities of the Center for Energy Policy and Research and to operate the Energy Information Center as an outreach channel in its own right are the responsibility of the Associate Director for Information Service, aided by the Associate Director for Technical Programs, a part-time Assistant Cataloger and, recently, two full time CETA employees assigned to the Center by Nassau County, New York.

Their routine activities include: (a) locating, obtaining, and cataloging new materials according to the acquisition policy described above; (b) preparing monthly Selected Acquisition Lists for circulation among staff; (c) expanding the NYIT Energy Referral Service roster to include new organizations and updating the computer program designed to store and selectively generate organization names; (d) updating and revising the various methods of accessing Energy Information Center resources including the Thesaurus of Descriptors; and (e) alerting other staff members of the availability of new materials pertinent to their professional interests.

The staff also performs a backup function for the New York Tech Energy Hot Line which involves the provision of materials to (f) identify likely Hot Line questions; (g) prepare documented answers; (h) update indexed Question and Answer cards; (i) develop special information packets; and (j) conduct the research necessary to answer Hot Line questions in situations where Question and Answer cards are not adequate.

For technical and professional people who require information, the staff directly performs a variety of outreach services including (k) conducting and reporting of original research; (l) preparation of individualized bibliographies; (m) initation of TECHSEARCH computer literature survey; and (n) generation of individualized lists of contacts or other referrals. Samples of letters in which these services were provided are included in the Appendix.

Finally, the staff (o) expedites the research goals of all visitors to the Energy Information Center.

A related activity handled through the auspices of the Energy Information Center by the Deputy Director of the Center for Energy Policy and Research involves providing detailed explanations and materials on various aspects of the NYIT Energy Advisory Service in response to requests from public and private organizations and individuals across the country and abroad.

In all of these activities, the Staff Associates of the CEPR are used as consultants in their respective areas of expertise as required.

Energy Information Center Operating Statistics

Careful records were kept on the performance of the NYIT Energy Information Center as an outreach activity which in its own right directly services the often complex and technical information needs of various professionals in the field. Pertinent information on each Energy Information Center user was recorded on "Request for Information" form (see Appendix). The statistics presented in this section are based on an analysis of 487 "Request for Information" forms completed on Energy Information Center users between June 1, 1976 and February 28, 1978. All quantitative data reported below and throughout this report were analyzed on the NYIT Xerox Sigma 9 Computer with descriptive statistics and cross tabulations using the Statistical Package for the Social Sciences (SPSS).

(i) Energy Information Center Users.*

Of all requests to the Energy Information Center, 57.3% (N=279) were posed by various kinds of participants in the energy policy *decision-making process* broadly defined to include elected and administrative personnel, bankers, media personnel, academic and private researchers and citizen group members. Another 12.1% (N=59), came from representatives of *private industry and commerce;* and 9.9% (N=48), from *energy influential business* persons such as architects, engineers, real estate developers, builders and contractors. Operators and/or managers of *public institutions* such as schools, hospitals, and libraries used this outreach program less frequently (3.7%, N=18). Table 1 below presents a statistical summary of the various categories of Energy Information Center users and contrasts markedly with a similar table describing the New York Tech Energy Hot Line callers (see Table 7, page 33).

TABLE 1

NYIT ENERGY INFORMATION CENTER USERS
(Not including Energy Hot Line callers)

Category of User	N	%
Homeowners	21	4.3
Industrial/Commercial firms	59	12.1
Energy influential businesses	48	9.9
Public institutions	18	3.7
Decision-makers	279	57.3
Category unknown	62	12.7
	487	100.0%

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*Does not include Energy Hot Line callers, but only those who were serviced directly by the Energy Information Center

Energy Information Center users became aware of this outreach program through a variety of mechanisms. Energy Advisory Service activities such as the interactive television Energy Management Seminar program and the Hot Line were particulary effective (32.3%, N=110) as was a "word-of-mouth" referral dynamic (31.4%, N=107). Table 2 summarizes these various paths towards awareness.

TABLE 2

SOURCES OF ENERGY INFORMATION CENTER AWARENESS

Sources	N	%
Other Energy Advisory Service Programs	110	32.3
Referrals	107	31.4
Print media including Hot Line flyers	79	23.1
Fair participation	9	2.6
Other	36	10.6
	N=341	100.0%

The requests made by Energy Information Center users arose either in the context of letters (32.4%, N=151); over the telephone (41.2%, N=192) or during personal consultations (24.5%, N=114).

Geographic origin of requests also varied. While more than 70% of users resided in the tri-state area covered by the Energy Advisory Service, another 27.7% of users lived elsewhere in the United States, and 2.2%, abroad. Table 3 presents a detailed summary.

TABLE 3

GEOGRAPHIC ORIGIN OF ENERGY INFORMATION CENTER REQUESTS

Origin	N	%
Long Island, New York	104	22.5
New York State (other)	165	35.7
New Jersey	43	9.3
Connecticut	12	2.6
Other States	128	27.7
International	10	2.2
	462	100.0%

(ii) Nature of Information Requests

Users asked the Energy Information Center a total of 678 questions including 213 on the establishment, organization, and operation of the NYIT Energy Advisory Service and its component programs. The nature of requests varied widely. For descriptive purposes, requests were organized into 25 topic areas. Table 4 below indicates the frequency with which requests arose about each of these topics.

TABLE 4

FREQUENCY OF ENERGY INFORMATION CENTER REQUESTS ON VARIOUS TOPICS (not including requests from Hot Line callers)

Topics	N	%
1. Solar energy including hot water, space heating, air conditioning, equipment performance studies, cost-effectiveness	80	17.2
2. Residential conservation	72	15.5

-continued-

TABLE 4 (continued)

	Topics	N	%
3.	Commercial/Industrial energy management programs including educational/ health care/food facilities	58	12.5
4.	Requests for preparation of bibliographies	39	8.4
5.	Alternative sources of energy including wood, wind, geothermal, tidal	31	6.7
6.	Financing conservation through taxes, government programs and bank loans	31	6.7
7.	Requests for assistance in developing energy courses/curricula	29	6.2
8.	Citizen-awareness training/decision-making, participation	18	3.9
9.	Governmental conservation programs	18	3.9
10.	Conventional sources of energy including crude oil, natural gas, coal, electricity and data on any of the aforementioned	14	3.0
11.	Conservation in transportation including electric vehicles	12	2.6
12.	Energy conserving building design including solar homes	9	1.9
13.	Energy legislation and policy	7	1.5
14.	Energy audit	7	1.5
15.	Energy and environmental land use	7	1.5
16.	Waste heat recovery techniques	6	1.3
17.	Appropriate Technology	5	1.1
18.	Energy and life style changes/consumerism	4	0.9
19.	Careers in energy	4	0.9
20.	Nuclear fission	3	0.6
21.	Requests for speakers and location of demonstration sites	3	0.6
22.	Thermography	2	0.4
23.	Surveys of energy-related attitudes	2	0.4
24.	Energy-related inventions	2	0.4
25.	Media coverage of energy	2	0.4
		465	100.0%

To convey some sense of the complexity and detail involved in most information requests, a count was taken of the frequency with which various Energy Information resources (in addition to staff professional expertise) were utilized in the process of conducting research for users. Table 5 below indicates that the up-to-date Vertical File material provided the research tools to handle 50.2% (N=253) of requests, and that the NYIT Referral Service was called into play in 31.0% (N=156) of the cases, either to provide individualized lists of contacts or to locate individuals who could provide the Energy Information Center with answers or materials needed to complete the research. The individualized lists of contacts which were prepared for users contained a median of 8.5 referrals each.

TABLE 5

EMPLOYING ENERGY INFORMATION CENTER RESOURCES TO PROCESS INFORMATION REQUESTS

EIC Resource	N	%
Books/Periodicals	64	12.7
Vertical File Material	253	50.2
Referral Service	156	31.0
TECHSEARCH	12	2.4
Other	19	3.7
	504	100.0%

(iii) Processing Energy Information Center Information Requests

Depending upon the subject matter of an information request, processing came under the supervision of either the Associate Director for Information Service, the Associate Director for Technical Programs or the Deputy Director. The Information Specialist supervised the processing of 39.1%,(N=190) of all requests; the Technical expert, 17.5%,(N=85); and their team effort was required in another 2.2%,(N=10) cases. The Deputy Director handled 35.2%,(N=171) of requests which almost exclusively concerned detailed information on organizing and implementing outreach programs similar to the NYIT Energy Advisory Service.

Almost equal numbers of users received either original letters (39.4%, N=161) in which research results and individualized lists of contacts were reported, or letters of transmittal (39.6%, N=162) in which reference was made to the enclosure of required printed matter. Other information requests were completed over the telephone (11.0%, N=45) or in face-to-face consultations with users who visited the Energy Information Center(4.4%, N=18).

In 35.4% (N=165) of the cases, users were provided with copies of printed material, and in 5.4% (N=25) cases they received copies of only title sheets (on which instructions were clearly printed for obtaining the full article from outside sources).

These activities took anywhere from one day to over a month to accomplish as Table 6 describes.

TABLE 6

AMOUNT OF TIME TO COMPLETE THE PROCESSING OF ENERGY INFORMATION CENTER REQUESTS (not Hot Line requests)

Time	N	%
Same day	110	28.6
under 1 week	100	26.0
1 - 2 weeks	77	20.1
2 - 3 weeks	24	6.3
2 - 4 weeks	40	10.4
over a month	33	8.6
	384	100.0%

As this table indicates, the Energy Information Center serviced more than a majority of users in under one week.

General Description: New York Tech Energy Hot Line

The objectives of the New York Tech Energy Hot Line are at once to provide up-to-date and immediate answers to practical energy conservation questions and to operate this service in a manner consistent with testing its effectiveness as a mechanism for energy technology dissemination. By way of example, specific information is available to homeowners on reducing heating and air conditioning bills, to business persons on establishing energy management programs, and to public officials on cost effectiveness of energy conserving equipment.

The New York Tech Energy Hot Line is supervised by a professional staff member and operated by trained paraprofessionals who have before them the answers to hundreds of questions likely to arise as part of the service. Hot Line callers receive answers immediately on the phone, and are provided by mail with pertinent pamphlets published by government or private sources and special information packets prepared especially for Hot Line purposes.

The NYIT Energy Information Center/Referral Service complex provides materials to plan, prepare and implement the Hot Line and to research those queries, often posed by technical and professional leaders, which are outside the more general purview of the Hot Line service.

The New York Tech Energy Hot Line (516 686-7744) was opened to the general public on October 18, 1976, after a six-month preparatory period and a four-day trial operation. The trial run began at an Energy Fair sponsored by Nassau County, New York, from September 30th to October 3rd, 1976. NYIT students were commissioned to design a Hot Line exhibit booth which was then constructed by NYIT Buildings and Grounds personnel. A telephone was installed in the booth from which fair visitors could call the Hot Line at our expense. During the course of four days, more than 1,000 flyers advertising the Hot Line were distributed and more than 200 calls were received. This trial period permitted us to test out operating procedures and to give Hot Line operators first-hand experience prior to the October 18th inauguration date.

The Hot Line operates from 10:00 AM to 4:00 PM Monday through Friday. A telephone answering machine is connected at all other times to advise callers of operating hours. Two local telephone lines are used. The number of available telephone lines necessitated controlling the timing and placement of publicity as a means of avoiding caller frustration with a continually busy number and as a means of determining the effect of a particular publicity approach on volume of calls.

Establishing the Hot Line

The major tasks involved in establishing the Hot Line were: (i) identifying questions likely to be asked and preparing documented answers; (ii) developing a procedure for organizing and displaying question and answer material at the telephone operators' stations; (iii) selecting and procuring pertinent publications to be used in mailing; (iv) recruiting and training Hot Line operators; and (v) publicizing the Hot Line.

(i) Identifying Questions

To identify likely Hot Line questions, staff members read materials in the NYIT Energy Information Center. Once a question was identified, its substantive content was summarized in terms of a "key word" for easy reference. Questions were then assigned to one of 18 "major categories" developed for organizational purposes. "Major categories" include the following:

Energy Conservation
Insulation
Heating, Ventilation, and Air Conditioning
Appliances
Energy Management
Solar
Alternate Energy Sources
Wind Power
Nuclear
Natural Gas
Crude Oil
Coal
Energy Statistics
Transportation
Energy Policy
Environment
Agribusiness and Energy
Glossary

For each question, an index card was prepared on which the "major category," "key word," and specific question were recorded along with a documented answer, and references to pertinent pamphlets and special information packets. On-going Hot Line operation has provided the basis for development of subsequent questions which, in turn, are researched by using materials in the NYIT Energy Information Center and then added to the index card file.

(ii) Organizing and Displaying Question and Answer Material

To display indexed Question and Answer cards, a rotary stand (or carousel) normally used in libraries to retain and retrieve microfiche was purchased. The New York Tech Energy Hot Line Rotary Stand consists of a number of two-sided rigid panels which have twenty pockets per side into which Question and Answer index cards are inserted. Each two-sided panel is labeled with the "major category" characterizing all Question and Answer cards to be found on the panel. Each index card belonging to the category is inserted in the panel in such a way as to hold its "key word" in full view. When a specific question is posed, the Hot Line Operator rotates the stand until the panel labeled with the proper "major category" becomes visible. He or she then quickly scans the "key word" headings visible on the panel until the appropriate card is located. The Operator then removes the card from its pocket, reads and explains the documented answer over the telephone, and returns the card to its proper place.

To date, 442 index cards have been prepared of which 289 deal with specific questions on energy conservation and alternative energy subjects and the remainder constitute a glossary of energy terms. Volume III provides a complete replica of all information appearing on the Question and Answer cards.

(iii) Mailed Informational Materials

Since detailed information is not always readily transmitted over the telephone, a decision was made to mail all Hot Line callers one or more pamphlets which could also answer their queries and provide greater detail. Pamphlets selected for this purpose, now numbering 104, are each assigned a code number and ordered in bulk quantity. Almost all Question and Answer index cards contain one or more code number references to this supplemental material. In this way, Hot Line Operators know at a glance appropriate materials to mail to callers. Volume III presents a key to the pamphlet collection in which code numbers are correlated with pamphlet titles and in which information on each pamphlet is provided concerning issuing source, date, cost (if any), and recommendations for acquiring bulk supplies.

It was soon determined that for a number of subjects no printed literature has been prepared for laypersons, or existing pamphlets would not suffice. To improve Hot Line operation in this situation, the resources of the NYIT Energy Information Center were used to assemble small information packets pertinent to these topics. To date, there are 40 areas for which special information packets have been prepared. Each packet is assigned a code number, duplicated in quantity and referenced on appropriate Question and Answer cards. Volume III presents a key to the special information packets in which code numbers are matched to packet titles.

(iv) Recruiting and Training Operators

With answers to many queries prepared in advance and quickly retreivable on the rotary stand, paraprofessionals could be used as telephone operators to handle routine inquiries. It was within this context that NYIT students and other volunteers became particularly important. NYIT students were sought as volunteers and for hourly pay by placing advertisements in the campus newspaper, by making direct appeals at meetings of various NYIT extracurricula clubs, and by encouraging NYIT faculty to include Hot Line duty as a course requirement when academically justifiable. Other personnel were recruited from volunteer agencies in the area and from the pool of CETA applicants in Nassau County, New York. Since inception of the Hot Line in October, 1976, these activities have engaged 36 student volunteers, 11 student employees, 4 professional volunteers, and two CETA personnel for a total cadre of 53. At any one time, two to four paraprofessionals are on duty under professional staff supervision.

Training involves familiarizing operators with the rotary stand and with the materials described above. Operators are rehearsed in mock Hot Line conversations and are taught to complete a standard log sheet after each call, to prepare mailings, and to code log sheets and other evaluation forms for entry into the computer.

Substantial time is taken to train operators in techniques which can assist callers to pose their questions more cogently. For example, where callers' questions are vague or unfocussed, operators are instructed to convey to callers that type of information which extends the caller's knowledge sufficiently to permit him or her to make a more specific information request. Operators are also trained to inform callers that printed material will be forwarded and to invite return calls for the purpose of discussing lingering ambiguities by reference to specific page numbers in the printed matter.

There are potentially four contacts the caller may reach through the Hot Line: the first call is answered by a paraprofessional operator; calls may be referred to (or the operator may ask questions of) the professional supervisor; an engineer may provide technical information--immediately or through call-back; and if the answer has still not been found, a staff member will use the Energy Information Center/Referral Service facilities to research the question and call or write back.

(v) Publicity Activities

For the purpose of gaining publicity for the Hot Line in a manner consistent with its experimental nature, the staff issued news releases, gave interviews to print and mass media services, informed organizations registered with the NYIT Energy Referral Service of the Hot Line telephone number, attended various energy fairs, circulated Hot Line flyers on an individual basis to hundreds of area post offices and libraries and to more than 1,000 architects, engineers, contractors and other technical and professional leaders participating in the NYIT/ERDA Energy Management Seminar program; and circulated thousands of Hot Line flyers in bulk to various associations and organizers of energy conservation events upon their request.

The publicity program produced special mention of the Hot Line in more than 57 newspapers (many local to Long Island), on 7 radio and television programs and in scores of national and local professional, business and trade association newsletters and magazines. (See Table 48 , page 107 for a complete listing of all known print and media references to the Hot Line and the Appendix for selected examples of items appearing in print.)

Organizations listed in the NYIT Energy Referral Service which learned of the Hot Line through these various activities, helped spread awareness of the service even further by referring their callers to us. Those following this practice on a regular basis include:

> National Solar Heating and Cooling Information Center, Brookhaven National Laboratories, U. S. Department of Energy, Region II, Better Business Bureau, Consumers Union, Long Island Lighting Company, and Nassau and Suffolk Counties Cooperative Extension Services and Consumer Affairs agencies.

On-Going Hot Line Activities

In addition to answering questions over the telephone, activities associated with on-going Hot Line operation include (a) expanding and updating indexed Question and Answer cards through use of the NYIT Energy Information Center materials, (b) training new paraprofessionals, (c) selecting and obtaining new pamphlets in bulk, (d) maintaining supplies of the existing pamphlet stock, (e) assembling special information packets as the need arises, and (f) collecting and coding data on the Hot Line as a mechanism for studying its effectiveness for energy technology transfer and as a means of improving its operation.

A related activity handled by the professional staff has involved the preparation of materials to meet the growing number of requests from energy planners here and abroad to share operating experiences and materials as a means of facilitating activities to start similar Hot Line services elsewhere. For example, upon request of the Energy Policy and Planning Unit of the Executive Office of the President of the United States, the Center for Energy Policy and Research provided the White House in June, 1977 with a complete duplicate of the New York Tech Energy Hot Line telephone operator station, including the hundreds of questions and answers which had been developed, our special rotary stand equipment and techniques, copies of informational materials mailed to each caller and copies of the Hot Line Operators Instruction Manual.

Similar materials (except for the rotary stands) were requested by and provided to the Directors of the ten demonstration Energy Extension Service programs in Alabama, Connecticut, Michigan, New Mexico, Pennsylvania, Texas, Tennessee, Washington, Wisconsin and Wyoming. The EES in turn made these materials available to state energy officials in California, New Jersey and Puerto Rico.

Over and above these instances 26 additional organizations have asked for detailed materials to plan and implement telephone services patterned after ours. It is hoped therefore that this report can be reproduced by the Government Printing Office and made available to the 50 States in general and to the requesting organizations listed in the Appendix to this report.

New York Tech Energy Hot Line Operating Statistics

Homeowners and others in the tri-state metropolitan area could avail themselves of the Hot Line service by telephoning, writing, or attending any of the various energy fairs at which Hot Line personnel were present. Detailed information was obtained on each Hot Line caller and writer and was recorded on "log" forms (see the Appendix). However, "head-counting" was the extent of record keeping activities possible at energy fairs where general excitement and turmoil precluded more detailed cataloging.

This section contains a statistical assessment of the operation of the Hot Line/Information Center/Referral Service complex based on an analysis of 2,374 "log" forms completed on calls and letters transpiring between October 18, 1976 and February 21, 1978. (Due to an unfortunate routing error in the otherwise excellent operation of the NYIT Computer Center, 368 additional "log" form sheets representing primarily September 1977 Hot Line calls were lost before data could be entered into the computer.)

(i) Hot Line Users

In the 2,374 cases analyzed, the greatest usage of the Hot Line was made by homeowners (66.5%). The service was also utilized by individuals representing the following categories: executive officers/managers/operators of *industrial and commercial firms; energy influential business people* who by their pricing and practice determine the attractiveness and availability of energy conservation equipment and technology (builders, contractors, real estate developers, architects, engineers); operators/managers/employees of *public institutions* (schools, hospitals, libraries); and *decision-makers* including all individuals with the authority or expertise to influence energy conservation public policy and practice (administrative officials, elected officials and staff, bankers, media persons, citizen group members and academic and private researchers). Table 7 below presents a statistical summary of the various categories of Hot Line callers.

TABLE 7

NEW YORK TECH ENERGY HOT LINE USERS

Category of User	N	%
Homeowners	1,607	66.5
Industrial and Commercial Firms	158	6.5
facility operators (N=90)		
managers (N=25)		
executives (N=43)		
Energy Influential Businesses	118	4.9
builders/contractors (N=35)		
real estate developers (N=14)		
architects (N=39)		
engineers (N=30)		
Public Institutions	28	1.2
schools (N=24)		
hospitals (N=4)		
Decision-makers	310	12.8
administrative officials -- energy, health, and education (N=163)		
elected officials and staff (N=4)		
bankers (N=2)		
media persons (N=20)		
citizen group members (N=37)		
academic & private researchers (N=84)		
Category unknown	195	8.1
	2,416	100.0%

When Hot Line users were asked how they intended to employ requested information, 65.5% replied "in my home;" 5.9%, "to improve energy usage at my place of work;" 13.0%, to carry out a job assignment; and 15.5%, for "personal information only."

Men called the Hot Line more often than women--69.4% (N=1586) versus 30.6% (N=698)--and usage of the service was heaviest in the morning hours as depicted in Table 8.

TABLE 8

USAGE OF HOT LINE BY TIME OF DAY

Time	N	%
Before opening	106	5.3
10:00 - 11:00 AM	483	24.0
11:00 - 12:00 NOON	391	19.4
12:00 - 1:00 PM	257	12.7
1:00 - 2:00 PM	200	9.9
2:00 - 3:00 PM	234	11.6
3:00 - 4:00 PM	244	12.1
After closing	101	5.0
	2,016	100.0%

In light of the Hot Line's Long Island address and telephone number, it is not surprising to find in Table 9 below that local residents made the most use of the service. However, sizeable numbers of requests also originated both from other areas covered by the NYIT Energy Advisory Service which include adjacent counties in metropolitan New York State, New Jersey and Connecticut, and from far beyond.

TABLE 9

GEOGRAPHIC ORIGIN OF HOT LINE REQUESTS

Origin	N	%
Long Island, N. Y.	1,319	59.7
New York State (including New York City)	601	27.2
New Jersey	157	7.1
Connecticut	23	1.1
States beyond	109	4.9
	2,209	100.0%

(ii) Hot Line Inquiries

Hot Line users asked the Hot Line a total of 5,953 questions with 37.3% asking about one specific topic; 16.1%, asking about two; 8.8%, about three; and 37.8%, about as many as four discrete areas.

For the purposes of analysis, 12 topic headings were developed to subsume various areas about which inquiries arose:

(1) *Residential Conservation* of energy including insulation, weatherization, HVAC systems, home appliances, lighting and heat pumps.

(2) *Commercial Retrofit* including energy management programs and HVAC systems.

(3) Residential and Commercial *Energy Audits* and allied heat loss calculation.

(4) *Solar Energy* applications for hot water, space heating, air conditioning, and swimming pool systems.

(5) Requests for *Professionals* who design, manufacture, distribute, install and/or service energy conservation and solar products and/or systems.

(6) Energy Conserving *Design* for new and retrofitted buildings and landscaping including standards, codes, zoning.

(7) *Financing* energy conservation through taxes, government programs and bank loans.

(8) *Conventional Sources* of energy including petroleum, natural gas, coal, electricity and energy conversion data concerning BTU equivalents, degree days and the like.

(9) *Nuclear Fission*

(10) Wood, Wind and other *Alternative Sources* of energy including nuclear fusion, geothermal, tidal, biomass, and shale oil.

(11) *Special Requests* for printed literature, bibliographies, directories, audio-visual material; for speakers, speaker bureaus, and other contacts; and for locations of nearby energy conserving and solar demonstration sites.

(12) *Others* including matters dealing with transportation, recycling, solid wastes, and the environmental trade-off of energy conservation.

Table 10 below presents a statistical summary of the frequency with which questions on these topics were posed.

TABLE 10

FREQUENCY OF HOT LINE REQUESTS ON VARIOUS TOPICS

Topic	N	%
(1) Residential Conservation	4,057	68.2
(2) Commercial Retrofit	92	1.5
(3) Energy Audit	51	0.8
(4) Solar Energy	716	12.0
(5) Professionals	114	1.8
(6) Design	57	1.0
(7) Financing	199	3.3
(8) Conventional Sources	76	1.3
(9) Nuclear Fission	10	0.2
(10) Alternative Sources	140	2.4
(11) Special Requests	265	4.5
(12) Others	176	3.0
	5,953	100.0%

Of the 12 topics created for the purpose of analysis, by far the most frequent inquiries concerned residential energy conservation in general (and insulation, in particular). However, this finding varied somewhat depending upon the category of Hot Line user and period of time. That is, Table 11 below looks at different categories of users and reports for each the three most popular topics of inquiry.

It can be seen that while questions about residential energy conservation were the most popular throughout, the second and third place for different user categories fluctuated among solar energy, financing and special requests for literature, contacts and the like. These data also suggest that homeowners' questions to the Hot Line showed less variation than questions arising from all other quarters. That is, according to this table, 90.4% of all questions which homeowners raised are encompassed by the three most popular topics listed. This percentage figure surpasses that of all other user categories, suggesting that *nonresidential* Hot Line users consistently posed questions on a greater variety of subjects.

TABLE 11

PERCENTAGE OF 3 MOST FREQUENT TOPICS OF INQUIRY BY HOT LINE USER CATEGORY

Category	3 Most Frequent Topics		
Homeowners	1. Residential conservation	76.5	
	2. Solar energy	10.9	
	3. Financing	3.0	
		90.4%	N=4,000
Industrial/Commercial Firms	1. Residential conservation	35.4	
	2. Special requests	14.0	
	3. Solar energy	12.7	
		62.1%	N=314
Energy Influential Businesses	1. Residential conservation	28.7	
	2. Solar energy	21.1	
	3. Financing	10.9	
		60.7%	N=247
Public Facilities	1. Residential conservation	57.3	
	2. Solar energy	17.3	
	3. Special requests	10.6	
		85.2%	N=75
Decision-Makers	1. Residential conservation	58.2	
	2. Solar energy	14.6	
	3. Special requests	8.9	
		81.7%	N=720

Interest in particular topics also fluctuated over time. For example, Table 12 looks at three quarters (Spring 1977, Summer 1977 and Fall 1977) in terms of heaviest proportion of inquiries about residential conservation and about solar energy. Considering all Hot Line questions about residential conservation during these periods, interest was strongest during Fall 1977; whereas interest in solar energy peaked during Spring 1977. (The latter might reflect either a true seasonal component to interest in solar energy or the Carter initiatives in this area announced in April 1977 as part of the National Energy Plan.)

TABLE 12

FLUCTUATION OVER TIME IN HOT LINE USER INTEREST IN RESIDENTIAL CONSERVATION AND SOLAR ENERGY

Time Period	% Interest in Topic	
	Residential Conservation	Solar Energy
Spring '77	14.7% (N=377)	59.5% (N=285)
Summer '77	21.0% (N=541)	30.7% (N=147)
Fall '77	64.3% (N=1651)	9.8% (N=47)
	100.0%	100.0%

(iii) Sources of Awareness

The dimensions of the Hot Line publicity program have been discussed elsewhere (see, page 31). Various activities produced special mention of the Hot Line in the print media (newspapers, journals, newsletters, and professional, trade, and business magazines) and on radio and television. Whenever a printed reference to the Hot Line occurred, there was an immediate (although unsustained) increase in phone calls and letters. For example, an article on the Hot Line in the *New York Times* in November 1977 generated more than 211 calls in the space of 6 days; an article citing the Hot Line in the professional journal, *Medical Economics*, encouraged more than 55 doctors to write within a month.

Various staff activities were also instrumental in developing Hot Line awareness. For example, the staff (a) circulated Hot Line flyers to a wide audience, and took special pains (b) to inform all participants in the interactive television Energy Management Seminar series of the service as well as (c) to acquaint all organizations listed with the NYIT Energy Referral Service roster.

These latter organizations not only used the Hot Line themselves, but they helped spread awareness of the service even further by referring their callers to us. Referrals also developed through a more informal, "word-of-mouth" dynamic as one friend told another. Table 13 below summarizes these various sources of Hot Line awareness.

TABLE 13

SOURCES OF HOT LINE AWARENESS

Sources of Awareness	N	%
Print/electronic media	664	34.2
Referrals	847	43.6
Circulation of Hot Line flyer	82	4.3
Staff activities	294	15.2
Participation at energy fairs	52	2.7
	1,939	100.0%

It should be noted that although our participation at various energy fairs did not generate many subsequent inquiries, it permitted Hot Line personnel to provide information and personal assistance to more than 1,800 fairgoers.

This table begins to suggest the importance that referrals have played in developing Hot Line awareness and usage. To study this matter differently, sources of Hot Line awareness for residential versus nonresidential users (industrial/commercial firms, energy influential businesses, public facilities, and decision-makers) were compared by use of simple contingency table analysis or two-variable cross tabulations. The tabulation in Table 14 below indicates that homeowners in particular learned about the Hot Line through a referral mechanism, but that for nonresidential users, various staff activities (including the interactive television Energy Management Seminar program) were more effective. One gets the impression from these data that the development of awareness of the Hot Line on the part of the public is aided by the well-established pattern of a "two-step" flow of information whereby "opinion leaders" in a community learn about a new event through various sources and then help to relay this information to the public-at-large through personal channels such as referrals.

TABLE 14

RELATIONSHIP BETWEEN RESIDENTIAL AND NONRESIDENTIAL HOT LINE USER CATAGORIES AND SOURCES OF AWARENESS

	User Categories			
	Residential		Nonresidential	
Sources of Awareness	N	%	N	%
Print/electronic media	530	40.4	89	19.9
Referrals	645	49.0	127	28.3
Hot Line flyer	44	3.3	28	6.3
Other Staff activities	60	4.6	191	42.6
Fair participation	35	2.7	13	2.9
	1,314	100.0%	448	100.0%

(iv) Suitability of Hot Line Question and Answer Material

The Question and Answer cards in the New York Tech Energy Hot Line Rotary Stand proved suitable for answering 84.4% (N=3,091) of all inquiries. Included in this percentage figure are the 9.6% (N=349) responses which Hot Line operators developed impromptu by extrapolating or calculating from existing Question and Answer cards. The Energy Information Center/Referral Service complex was called into play to handle another 14.5% (N=527) inquiries (of which 8.2% went through the Referral Service and 6.3%, through the Energy Information Center). Often questions requiring assistance from the NYIT Energy Information Center/Referral Service complex were posed by media persons, architects, engineers, public officials and other professional and technical leaders in the energy field. Thus the questions posed by nonresidential users were not only about a greater variety of subjects (see page 37) but also were on a level of greater depth and complexity. When research was required, it normally took less than one hour to conduct (93.4%). Only 1.1% (N=41) of all Hot Line inquiries could not be satisfactorily completed by the time data for this report was being compiled.

The Question and Answer cards could handle some areas of inquiry better than others. Table 15 below presents data in this regard and pinpoints specific areas of greatest strength (Residential Conservation, Energy Audit, Solar Energy, Building Design, and Alternative Sources).

TABLE 15

THE SUITABILITY OF QUESTION AND ANSWER CARDS RELATED TO TOPIC OF HOT LINE QUESTION

	SUITABILITY OF Q & A CARDS		
TOPIC	COMPLETELY SUITABLE	ASSISTANCE FROM EIC/RS*REQUIRED	NOT SUITABILE
Residential Conservation (N=1793)	92.8%	6.9%	0.3%
Commercial Retrofit (N=86)	68.6%	31.4%	0
Energy Audit (N=47)	93.6%	4.3%	2.1%
Solar Energy (N=695)	88.9%	10.6%	0.5%
Professionals (N=112)	62.5%	36.6%	0.9%
Design (N=49)	79.6%	20.4%	0
Financing (N=172)	66.7%	32.8%	0.5%
Conventional Sources (N=67)	44.8%	53.7%	1.5%
Nuclear Fission (N=9)	66.7%	22.2%	11.1%
Alternative Sources (N=129)	83.7%	14.0%	2.3%
Special Requests (N=248)	61.7%	34.7%	3.6%
Other (N=173)	74.0%	19.0%	7.0%

*NYIT Energy Information Center/Referral Service complex

(v) Processing Hot Line Questions

Most Hot Line callers receive answers immediately over the phone, and are provided by mail with pertinent pamphlets published by government or private sources and/or special information packets prepared especially for the Hot Line to meet situations when simply written publications are not available or inappropriate.

For the purpose of Hot Line mailings, a form letter was prepared to indicate the enclosure of printed materials. This letter was appropriate in processing 74.9% (N=1,811) Hot Line calls. Original letters, usually reporting the results of research, were composed to process 3.1% (N=74) inquiries. No mailings were made in 22.0% (N=531) cases either because none were warranted (for example, when requests are for referrals alone, oral answers often suffice) or because the caller came in to personally pick up materials. As Table 16 presents, most mailings were prepared in one week or under. Mailings were normally sent out by third class mail because of funding limitations, and this frequently delayed receipt of the material sent by as much as three weeks.

TABLE 16

AMOUNT OF TIME TO PREPARE MAILINGS TO HOT LINE USERS

Time	N	%
One day	514	27.6
Under one week	705	37.9
1 - 2 weeks	309	16.6
2 - 3 weeks	103	5.5
3 - 4 weeks	101	5.4
Over a month	130	7.0
	1,862	100.0%

The number of enclosures in each mailing varied widely, but most people received five pieces of literature (28.1%). In 15.6% of the cases as many as eight or more were sent. Pamphlets found most useful in Hot Line mailings are listed below in Table 17.

At the same time as Hot Line callers are informed that printed material is being forwarded, they are invited to call the Hot Line back to discuss lingering ambiguities by reference to written materials. Of all Hot Line calls, 10.6 (N=211) were placed by previous users.

Throughout its 15-month operation, the New York Tech Energy Hot Line continued to expand and update its Questions and Answer material, improve the processing of Hot Line inquiries and tailor its service to the needs of each caller. For example, in addition to numerous phone calls, ten people visited the Hot Line facility on August 29th 1977, the day before applications were due at the New York State Energy Office for the U. S. HUD Solar Hot Water Grant Program. The Hot Line assisted these homeowners with the provision of grant applications, with assistance in following instructions for form completion and with advice on various methods of insuring arrival of the form in Albany, New York by submission deadline.

Some Hot Line callers need a great deal of help to expedite conservation measures; others require only nonpartisan reaffirmation of what they already know to take action. Whatever the need, the New York Tech Energy Hot Line has sought to make an impact on users' energy conservation attitudes and actions by providing a useful, thoughtful, and credible source of information.

6

TABLE 17

POPULAR HOT LINE PAMPHLETS

How to Start an Energy Management Program (U.S.D.O.C.)

Energy Conservation Handbook for Light Industries & Commercial Buildings (U.S.D.O.C.)

How to Profit by Conserving Energy (U.S.D.O.C.)

I've Got a Question About Using Solar Energy (ERDA-TIC)

Solar Energy for Heating and Cooling (ERDA-TIC)

Energy Conservation: Landscaping (FEA)

Energy Conservation: Windows (FEA)

Tips for the Motorist (FEA)

How to Save Money by Insulating Your Home (FEA)

Making the Most of Your Energy Dollars in Home Heating and Cooling (U.S.D.O.C.)

Total Energy Management (U.S.D.O.C.)

Solar Energy and Your Home (National Solar Heating and Cooling Information Center)

Solar Energy for Space Heating and Hot Water (ERDA-TIC)

How Solar Heating and Cooling Works (Minneapolis Honeywell Office of Public Affairs)

Energy Conservation: Heat Pumps (FEA)

Home Energy Savers' Workbook (FEA)

Energy Conservation: Energy Savings Through Automatic Thermostat Controls (ERDA-TIC)

Energy Conservation Measures for Commercial Buildings: Are They Worth It? (FEA)

An Energy Management Program for Commercial Buildings (FEA)

Project Retro-Tech: Home Weatherization Job Book (FEA)

Tips for Energy Savers (FEA)

Solar Hot Water and Your Home (National Solar H&C Information Center)

Energy Conservation: Insulate Your Water Heater & Save Fuel (ERDA-TIC)

How to Improve the Efficiency of Your Oil-Fired Furance (U.S.D.O.C.)

Tips for Energy Savers (FEA)

> "Very Informative. Gave good suggestions, very polite. Took time out to make sure I understood the answer. If party didn't know answer or quite understand my question, another consultant was brought in. In summary, a damn good job being done."
>
> New York Tech Energy Hot Line Caller
> (from evaluation questionnaire #0067)

Part B

Part B contains an analysis of the performance of the Energy Information Center/Referral Service/Hot Line Complex in terms of user satisfaction with the service and subsequent impact of the service on users' knowledge and actions about energy conservation. Subsequent action was measured against such evaluation criteria as number of actions taken, and a cost-to-savings ratio. To perform this analysis, quantitative and anecdotal data were gathered in two waves.

Methodology

In Wave One, a questionnaire consisting of structured and open-ended items was mailed almost exclusively to residential Hot Line callers along with the pamphlets which were promised over the telephone(see the Appendix). In Wave Two, a follow-up telephone interview schedule was utilized on a randomly drawn sample of homeowners who called the Hot Line between March and August 1977, (see the Appendix).

Wave One activities yielded a rate of return of 210 questionnaires, or 14%. It is recognized that data analyzed from this sample cannot be said to be representative of the entire universe of residential Hot Line users as those who return questionnaires may differ from those who do not.

Wave Two activities were undertaken in December 1977 and January 1978. The sample of residential Hot Line users was randomly selected by a computer from a complete list of all log form numbers assigned to homeowners using the service between March and August 1977. Some parties could not be reached even after three attempts; others had unlisted phones. Total sample size in Wave Two equalled 63. Since random sampling procedures were employed, conclusions arising in conjunction with data analysis can be generalized more readily to the universe of all residential Hot Line callers.

Wave One analysis provided data to answer the following questions:

(i) In terms of demographics and prior energy attitudes, what kinds of people used the Hot Line?

(ii) How satisfied were users with the service?

(iii) What did users do or intend to do about energy conservation *shortly* (2-3 weeks) after contacting the Hot Line?

Wave Two analysis provided data to answer the questions:

(i) Was initial interest in conservation actually converted into action *some months* after Hot Line contact and could action be attributed to the Hot Line service?

(ii) How much money did users spend to act on information provided over the Hot Line?

Answers to the last question will be used to calculate a cost-to-savings ratio for the NYIT Energy Information Center/Referral Service/Hot Line complex.

Wave One Analysis: Questionnaires

(i) Who Used the Hot Line

Hot Line questionnaire respondents were primarily male (73.2%,N=150), and of median age 40. They were high school (19.8%, N=39), or college trained (41.7%, N=82), earning salaries in the $20,000 - $30,000 range (41.7%, N=82) and by their own account, middle class (65.7%, N=132). More than 89% were owners of single family houses.

In general, Hot Line respondents felt personally affected by the energy situation and favorable toward energy conservation as a solution to the current problem. They were concerned with the availability of non-renewable energy sources in the future, but not convinced that energy conservation was the "best" solution to the energy situation when compared to eight other possible strategies. That is, 86.1% stated that past energy shortages had affected their homes and places of business and in ways which they could specify; 61.7% thought that U.S. energy supplies would be in "severe" shortage by 1987; and 63.6% gave "using energy wisely" the highest rating as a solution to energy problems. However, when comparing percentages of respondents to give the highest rating to nine possible solutions to energy problems, "using energy more wisely" followed "developing solar energy" in terms of popularity. Table 18 presents these data and rank orders most favored solutions.

TABLE 18

PERCENTAGES AND RANK ORDER OF HOT LINE RESPONDENTS WHO GAVE HIGHEST RATING TO VARIOUS ENERGY SOLUTIONS

Solutions	%	Rank Order
Developing solar energy	70.3	1
Using energy more wisely	63.6	2
Getting more information to people	48.2	3
Scientists	46.1	4
Concerned people	45.3	5
Federal government	32.3	6
Developing nuclear energy	25.6	7
Adjusting foreign policy	12.0	8
Oil companies	9.4	9

(ii) User Satisfaction with the Hot Line

Satisfaction with the Hot Line was high. Respondents were asked to judge several features of the service independently from "1" to "5" with "5" representing the best response. As Table 19 shows, from two-thirds to three-fourths of respondents accorded highest ratings (either "4" or "5") to each of four features.

TABLE 19

PERCENTAGE OF RESPONDENTS WHO GAVE VARIOUS HOT LINE FEATURES HIGHEST RATINGS

Features	N	%
Adequacy of Hot Line answer	123	68.7
Opportunity for General Education	120	67.4
Audibility of Hot Line Operator	124	72.5
Usefulness of Mailed Materials	139	74.8

The evaluation questionnaire provided space for Hot Line users to supply candid, general comments, and 72.9% (N = 147) of the sample took the opportunity to compose one or more remarks. Comments basically revolved around four topics.

The most popular topic for commentary (51%) concerned extended comments of praise. Common phrases used to describe the Hot Line included: "fine service," "very helpful," "unbiased source," "courteous," "terrific," and "convenient." Since Hot Line users had no means of knowing that the service was operated to maximize evaluation activities, some complimentary comments were spiced with concern that the Hot Line Service was not well enough known in the area. What follows are unedited examples of this type of commentary:

> --"Very informative. Gave good suggestions, very polite. Took time out to make sure I understood the answer. If party didn't know answer or quite understood my question, another consultant was brought in. In summary, a damn good job being done!"

> --"I was thrilled at the prompt attention I received by getting the information I requested just three days after requesting it. I cannot remember the last time I received this type of service. We appreciate it very much as it really helped us make our decision as to how to insulate our home. Thank you very much for your speedy response."

> --"Excellent source of unbiased, correct information regarding home heating problems. I had tried to get information from various oil companies, friends, magazine and news articles for several months. None of these sources was accurate. Your organization

put me in touch with an oil heating expert who *immediately* gave me the information I had been seeking and suggested possible solutions to heating problems we had been having for two years. Also is helping in deciding whether or not to have insulation blown in walls."

--"General info provided is very useful and enlightening. Mailed material a definite plus because it is always available for study and reference. I believe it is most important to educate and advise the general public, especially with regard to energy conservation, and the service Hot Line provides in this regard is most worthwhile and necessary. Keep up the good work! and Thank you."

--"I think the energy crisis is of national importance and that it may be solved to a great extent thru the voluntary cooperation of individuals. The "hot line" material you sent at least helps one individual to act. Energy conservation much like birth control cannot be legislated from Washington (or Albany) it takes each individual acting on his own."

--"Great idea! Saves much time that would have to be wasted in getting through gov't bureaucracy to get the same info. It's convenient and I found the people I talked to very cooperative."

--"The gentlemen I was privileged to talk with was helpful, courteous and knowledgeable. I think that Hot Line performs a valuable, necessary service and have recommended it to others. Thanks."

--"Thank you for the materials which have been sent to me. They were helpful in the textbook which I am presently editing and updating. These materials also helped me personally as a homeowner."

--"I've found this service to be helpful in answering questions I had before my attic was insulated. The literature that was sent to my home was very helpful in determining the contractor, the amount of insulation, and the various federal laws that must be adhered to. I will recommend this service to both family and friends when they are interested in saving money by insulating their homes."

--"I have taken your material to our office building materials yard, and I'm sure our customers will get much help perusing the booklets, and may make use of the Hot Line if we can't answer the questions."

--"The Hot Line was very useful to my husband and myself when we were thinking of having reinsulation done. Not knowing anything, the Hot Line gave me informative anwers which made our selection of material and procedures much more valuable."

--"Thank you for helping us decide (with some intelligence) what to insulate our home with."

--"Just great that someone is providing a place to get good information."

--"The info that I have received has been helpful in starting me off in solar."

--"Keep up the good work. Too bad you can't enroll some of our national *Leaders* in your program."

--"Do not go out of business. We will definitely need you more as we continue to run out of oil and gas."

--"I think the service is very helpful and hope it can be continued. But more people should know about it."

--"The service should be toll free just as the solar information service number is in Washington, which referred me to you for info on insulation materials."

The next most popular topic for commentary (23%) dealt with constructive suggestions for enlarging the scope of the service. These ranged from suggestions that more consumer-oriented materials be available including lists of endorsed products/contractors, product comparison and cost-effectiveness studies, and do-it-yourself advice; that the Hot Line become involved in other types of educational programs including mass media presentations, newsletters, a national energy conservation campaign and adult educational courses; and that the Hot Line take an active part in lobbying and in developing specific new programs for schools, local groups and others. Examples of comments follows:

--"You should be able to refer callers to reputable companies to have work done. Also have a price guideline so that a caller who needs work done should have some idea of what the cost should be and could make an educated estimate of savings."

--"What I would like to see is a rating of oil fired boilers for hot water heating, by efficiency and the cost of each."

--"People would like to know specifically who to call for service and quotes. Most people know what should be done. Neutral costs are main concern. Get recommendations of satisfied customers and comments from dissatisfied customers."

--"A list of persons willing to show you/send you information/ or give you figures on their solar heat/cooling costs and any ideas they actually have gained through direct knowledge and use of solar heating."

--"Would be helpful to have listing of reputable insulation contractors and list of disreputable ones in the area."

--"Organize material for those of us who cannot be do-it-yourself-ers, and head us in the most sensible and economical direction. (I'm a widow at present living on social security income only.)"

--"I would like to see N.Y.I.T. start a program for someone like myself who wants to become an expert in the solar energy field. Although I consider myself extremely well informed I know there is a lot of system design data that's uncollectable, ie; most manufacturers make only one component, heat exchanger, collector, storage tanks, etc. I would like to know how many BTU's one cubic foot of water can store as compared to stone. How long can this heat be stored? The approx. cost per square foot (liveable square footage) for a complete solar heating and hot water system. Also the industrial applications. Before systems can be converted, sold, or installed, the men like myself who will eventually do these tasks must first be trained. The sales people need data, hard facts to present to prospective customers. Adult education classes must be established through local schools. The list is endless. I believe only a school like N.Y.I.T. or a research center like Brookhaven could handle such a program."

--"Your service is only useful to the people who are truly trying to conserve energy, since it is only these people who have made inquiries. People don't believe the politicians, so I believe a mass campaign should be made to reach the general public sponsored by credible institutions (such as yours)."

--"Could you pressure county government (in town) to take the initiative with converting to solar heat & hot water."

--"Advise planning boards to make their energy efficiency codes and anti-pollution codes strictor as the energy situation decays."

In the third area of general commentary, some suggestions were voiced for improving operating procedures. Of all comments made about the Hot Line, only 22 fell into this category or 15%. Comments in this vein questioned the length of time some users waited to receive promised materials, the expertise of operators and the content of some answers. (Unless specifically requested, Hot Line mailings were sent by third class mail because of funding limitations. This would account for many of the noted delays.)

--"The mailing arrived about three weeks after my phone conversation. That is really too long."

--"So far (1½ weeks) information wasn't adequate. More is supposed to come but it takes too long to get a proper answer."

--"Slow to receive the information I requested."

--"The telephone operator did not seem to be well informed, but the publications I received were very useful."

--"Very clear and rapid information, but, you need to prepare a file of answers for difficult or specialized questions.

--"May 1976 information is probably out of date in developing areas such as solar collectors."

In the remaining comments (11%), users either abstained from passing judgement on the Hot Line until they had utilized the service more than once, they provided nonevaluative statements concerning their opinions on the energy situation, or they used the provided space to pose new Hot Line queries.

User satisfaction with the Hot Line was also measured in terms of absolute and relative credibility. In rating the Hot Line from "1" to "5" as a reliable source of energy information, 85.7% of the sample gave either a "4" or a "5" -- the highest ratings. This figure stands in marked contrast to the credibility attributed to a number of more conventional sources of information. Table 20 below rank orders the percentage of respondents to give each of nine sources of energy information highest ratings.

Research in the field of human behavior has found that individuals are more likely to act on information which they believe to be credible. Thus, in addition to overall high satisfaction with the Hot Line, the high marks accorded to the credibility of the Hot Line may help to explain the data reported below concerning the significant impact the service has had on the subsequent energy conservation actions of Hot Line users.

TABLE 20

PERCENTAGES AND RANK ORDER OF HOT LINE RESPONDENTS WHO GAVE HIGHEST CREDIBILITY RATINGS TO VARIOUS SOURCES OF ENERGY INFORMATION

Sources	%	Rank order
1. New York Tech Energy Hot Line	85.7	1
2. Professional journals	78.8	2
3. Federal Government	50.9	3
4. Newspapers	31.0	4
5. Network TV and radio	30.9	5
6. Friends and family	21.8	6
7. Oil companies	8.8	7
8. Local politicians	6.2	8
9. National politicians	3.2	9

(iii) Impact of the Hot Line on Residential Users

The questionnaire instrument utilized in Wave One analysis contained measures designed to study the effectiveness of the Hot Line for energy technology transfer. Energy technology transfer was defined in terms of the assertions Hot Line users made (a) regarding improvements in their knowledge about energy conservation technology and (b) regarding intention and/or behavior on behalf of conservation.

The KNOWLEDGE variable was measured by having respondents indicate if the Hot Line answer or mailed materials helped them to learn "a great deal," "somewhat," or "not at all" about energy conservation. Table 21 presents the results and indicates that a total of 95.9% attributed new learning to the service.

TABLE 21

IMPROVED KNOWLEDGE ATTRIBUTED TO HOT LINE

Response	N	%
a great deal	86	58.5
somewhat	55	37.4
not at all	6	4.1
	147	100.0%

To measure the INTENTION/BEHAVIOR variable, Hot Line users were asked to answer: "Will you act or have you already acted on any of the suggestions provided over the Hot Line?" As table 22 presents, 95% indicated that action had or would be taken.

TABLE 22

HOT LINE RESPONDENTS' ENERGY CONSERVATION INTENTIONS/BEHAVIOR

Response	N	%
Has already acted	86	42.6
Will act and has acted	4	2.0
Will act	103	51.0
Won't act	9	4.4
	202	100.0%

In addition, Hot Line users were asked to specify in what area they had or would act; 89% of the sample mentioned one discrete action; 16.2%, two;

and 7.6%, three. The most popular areas involv[illegible] insulation (47.3%), various steps to reduce electricity utilization (8.4%), general residential conservation practices (5.5%) and hot water and space heating (5.0%).

To push further into the meaning of these statistics and to determine whether intention to act (51.0%) was later converted into actual behavior, a second wave of data collection was begun.

Wave Two Analysis: Follow-up Interviews

Wave Two activities, which were begun in December 1977, involved telephone interviews with a randomly drawn sample of homeowners who called the Hot Line between March and August 1977. Successful contact was established with 63 Hot Line users, yielding the striking finding that more than half of the users interviewed have already acted on information provided over the Hot Line and they have spent an average of $1,280 each to make their homes more energy efficient.

The sample was randomly selected by a computer from a complete list of all log form numbers assigned to homeowners using the service during the period specified above. Underlying this procedure is the assumption basic to all modern survey techniques, namely that conclusions arising in conjunction with a randomly drawn sample can be generalized within known margins of error to the entire universe under study.

The sample was polled with a pre-tested telephone interview schedule to establish whether initial interest in conservation had since been converted into action attributable to the Hot Line and to obtain information on the dollar-value of users' energy savings attributable to the service as a basis for calculating a cost-to-savings ratio.

(i) Homeowners' Subsequent Actions Attributable to the Hot Line Service

The telephone interview schedule began with the basic inquiry: "Will you or have you acted on any of the energy conservation suggestions provided over the Hot Line?" Table 23 below indicates that for 52.4% (N=33) action has already begun, and that for another 20.6% (N=13) action is planned in the 1978 calendar year.

It should be noted that in the Wave One Hot Line questionnaire, which was administered shortly after service utilization, only 42.6% of respondents had indicated that they were practicing conservation measures (see Table 22, page 55). The association between passage of time and increasing frequency of action suggests that the 20.6% of interviewees who now indicate future intentions are probably not musing idly.

TABLE 23

HOT LINE INTERVIEWEES' ACTION STATUS

Action Status	N	%
Have acted	33	52.4
Will act	13	20.6
Won't act	15	23.8
No recall of having used Hot Line	1	1.6
Will not respond	1	1.6
	63	100.0%

Further, the 23.8% who according to the table will not act about energy conservation cited a variety of reasons including a realization from the Hot Line information that a particular measure would be impractical in their situation, and the lack of requisite funds. Reasons for inaction were organized into seven categories, reported in Table 24 below.

TABLE 24

HOT LINE INTERVIEWEES' REASONS FOR INACTION

Reasons	N	%
Action originally planned impractical	5	33.2
Action originally planned too expensive	1	6.7
Used Hot Line on behalf of another	1	6.7
Used Hot Line for academic purposes only	3	20.0
Hot Line answer not adequate	3	20.0
Hot Line mailing never received	1	6.7
Other	1	6.7
	15	100.0%

Of the 33 homeowners who have already taken action, 97% (N=32) said "yes," in response to the question, "Do you feel that the Hot Line answer or materials played any role whatsoever in your decision to act?" 75.8% (N=23) said that the Hot Line's role was of "major" importance; and 24.2% said it was "minor." Hot Line interviewees were probed for examples of the ways in which the Hot Line had helped. As Table 25 shows, comments basically revolved around five themes: the Hot Line assisted users (1) with helpful, enlightening information, (2) to save money, (3) to make a decision or judgement, (4) to deal more effectively with contractors and salesmen and (5) to improve the confidence that the correct action was being taken.

TABLE 25

EXAMPLES OF HOW HOT LINE HELPED HOMEOWNERS TO ACT

Form of Assistance	N	%
Enlightening information	22	59.5
Saving money	2	5.4
Making decisions	10	27.0
Dealing with contractors	2	5.4
Improving confidence in correctness of action	1	2.7
	37	100.0%

To illustrate exactly what users had in mind when differentiating between a major and minor role for the Hot Line, the following unedited verbatim remarks are provided:

> "Very helpful. Unbiased material...everyone has a song and dance. This material gave me the answer I was looking for. Salesmen do nothing but lie...they don't answer any questions truthfully." (Major)

> "I was originally thinking about installing foam, but after receiving Hot Line materials and weighing various considerations, I decided on cellulose. Hot Line influenced me on a major economic decision." (Major)

"I really liked the information. Quite Helpful." (Major)

"I did not know about R-values before I called the Hot Line;contractors don't explain things very well. I really felt like I knew what I was talking about when the contractor came in." (Major)

"Helped in evaluating decision to spend money. Great to have some authority to ask at one central location." (Major)

"Provided material that formed a basis." (Major)

"Explained how effective these means of conservation were" (Major)

"Mentioned things to do, but should use brand names." (Minor)

"Finding out R-values; how much insulation to use." (Minor)

"Helpful information was provided." (Minor)

"Provided information and guidelines." (Minor)

Energy conservers (N=33) were further queried to ascertain areas in which they had taken action. Table 26 summarizes the results.

TABLE 26

AREAS OF ACTION TAKEN BY HOT LINE INTERVIEWEES

Action areas	N	%
Insulation	28	27.7
HVAC	12	11.9
Weatherization	7	6.8
Lighting	44	43.6
Home appliance	2	2.0
Heat pumps	1	1.0
Other residential conservation	3	3.0
Solar Hot Water systems	2	2.0
Building design	1	1.0
Wood burning stove	1	1.0
	101	100.0%

(ii) Spending Money to Conserve

According to the interview schedule, for 7 (21.2%) of the energy conservers, these actions were the very first taken on behalf of conservation; and for 32 (97.1%), their accomplishment involved the outlay of money. Interviewees were asked to detail the expense associated with activities.

Twenty-eight (28) homeowners could oblige with money figures which ranged from lows of $75.00 for an automatic thermostat control device and $75.00 for changes in new home construction plans to highs of $4,000 for complete residential insulation and $4,200 for residential weatherization in conjunction with the installation of a solar hot water system.

Four (4) homeowners who had spent money could not itemize expenses although they were more than willing to indicate what they had done: (1) installation of a heat pump, (2) reinsulation, (3) insulation of walls and attic, and (4) insulation of garage area and installation of cast iron boiler. Based on materials available from the NYIT Energy Information Center and from professional, trade and business associations, it was possible to assign a conservative dollar-value to these activities as follows: (1) $3,500, (2) $1,200, (3) $1,400, and (4) $ 350.

When dollar amounts were tallied, these thirty-two (32) energy conservers had already spent $40,950 or an average of $1,280 each.

Summary

The results of Wave One and Wave Two analysis indicate that the New York Tech Energy Hot Line effectively brought homeowners and consumers energy conservation information which they found informative and credible, and delivered in a manner receiving their praise. In most user's judgments, which were reached both shortly after utilization and some months later, the service imparted new knowledge and triggered energy conserving actions by more than a majority of homeowners in the area served. Thus, it can be concluded that in addition to being an effective method of energy technology transfer according to empirical measurement techniques, the New York Tech Energy Hot Line helped to effect major savings in energy consumed while stimulating the economy of the area through increasing investment in energy conserving systems, equipment, materials and services.

Cost-to-Savings Ratio

Total NYIT Energy Advisory Service cost from initiation or June 1, 1976 to termination on February 28, 1978 amounted to $315,000. The Energy Information Center, the Referral Service, and the Hot Line are three channels of communication which functioned together as one complex to service various kinds of users. For most homeowners and consumers, conservation information was effectively disseminated by the Hot Line alone. But to be of serious value for many professionals and decision makers who often require complex and technical information, the Hot Line was backed up by the Energy Information Center/Referral Service and by a substantial professional staff knowledgable in the various energy areas involved.

Accounting procedures indicate that 68% of the total EAS budget or $214,000 was expended on the Energy Information Center/Referral Service/Hot Line complex (including start-up costs). Of the $214,000, $96,000 was spent on the Energy Information Center exclusive of acquisitions, $24,000 on the Referral Service, $54,000 on the Hot Line and $40,000 on start-up activities associated with all three channels.

A cost-to-savings ratio for the Complex can be calculated on the basis of statistics presented throughout this report:

(1) Total usage of the Hot Line service during the 15 month period commencing October 18, 1976 to February 28, 1978 equals 5,389 (see, page 13).

(2) According to data analyzed from 2,374 log forms, 66.5% of all users were homeowners (see Table 7, page 33).

(3) Consequently, the total universe of residential Hot Line users equals 66.5% times 5,389 or 3,584.

(4) According to data obtained from Hot Line follow-up telephone interviews, 52.4% of a randomly drawn sample of residential Hot Line users have already acted on information provided over the Hot Line and they have spent an average of $1,280.00 each to make their homes more energy efficient. (see, pages 57 and 61).

(5) Consequently, 52.4% of 3,584 residential Hot Line users or 1,878 homeowners can be said to have spent $1,280 each or $2,403,840 in all.

By assuming that energy conservation money investments would produce energy cost savings within 5 years at least equal to the investment, a cost ($214,000)-to-savings ($2,403,840) ratio for the Energy Information Center/Referral Service/Hot Line Complex would be on the order of 1 : 11. This ratio does not take into account money investment in conservation made by non-residential Hot Line users. (That these types of users undertook conservation is known from the evaluation instrument employed to conduct a comparative analysis reported in Section Four, but it was not possible to assign a dollar-value to actions or to advance meaningful estimates of savings in energy consumed.) Conservatively speaking then, for every dollar spent to operate the NYIT Energy Information Center/Referral Service/Hot Line Complex, at least eleven dollars were returned in major savings in energy consumed. A valuable economic by-product was the stimulation of the economy through increased investment in energy-related products and services.

SECTION THREE

CASE STUDY: The ENERGY MANAGEMENT SEMINAR PROGRAM

Part A

General Description: The Energy Management Seminar Program

As part of the Energy Management Seminar Program the Center for Energy Policy and Research has organized two series of interactive television seminars. The Winter '76 series consisted of ten seminars conducted over a five-day period in November and December. The June '77 series consisted of six seminars conducted over a three-day period. Detailed discussions of all aspects of the first series were set forth in the NYIT Energy Advisory Service Preliminary Project Assessment, June 1, to December 30, 1976 and the NYIT Energy Advisory Service Initial Evaluation Report, January 31, 1977 which are incorporated into this report by reference. Areas covered in each seminar offered in the Winter '76 series included: (a) practical applications of solar energy, (b) energy conserving building design, (c) energy management techniques, (d) energy management systems, (f) financing of energy conservation and (g) energy legislation and tax policy. Areas covered in each seminar in the June '77 series included: (a) energy management systems, (b) survey of solar heated and cooled residences, (c) the NAHB-HUD Energy Efficient Residence, (d) financing of energy conservation, (e) energy conserving building design and (f) ASHRAE standards for energy conservation.

Each series was offered in cooperation with the Metropolitan Regional Council whose television network (MRC-TV) was utilized. Seminars were broadcast from the MRC headquarters studio in the World Trade Center in New York City and received in eight regional MRC-TV studios in New York (White Plains, Mineola and Islip), New Jersey (New Brunswick, Hackensack, Newark and Union) and Connecticut (Stamford).

Approximately 1,000 architects, engineers, builders, bankers, business persons and public officials came to one or another of the nine studios to participate in two-way discussions with energy experts assembled at the World Trade Center. That is, all participants could see and hear all other participants in these interactive television seminars and they could do so with minimal traveling time and at no cost for admission.

Basic informational material for use in each series was produced and videotaped in advance at the television studios of the New York Institute of Technology at Old Westbury, New York. This material included interviews with prominent energy experts, slides, motion picture clips, charts and other illustrations.

Among other secondary impacts arising from the interactive TV Energy Management Seminar series, we have produced two specially edited, full color video programs for educational use by requesting organizations. Solar Energy Today which is 55 minutes in length and Energy Conservation in Residential Construction which is 25 minutes long are available for general distribution over cable and open-circuit television and in 3/4 inch video cassette form for group viewing and discussion. Thus far 61 organizations have shown these programs to an estimated audience of 1,200 in addition to the 1,000 seminar participants. In all then, seminar videotaped materials have reached more than 2,200 professionals, plus uncounted viewers on cable television.

From our pioneering activities with this media, we have learned that substantial lead time is required to organize the attendance of specialized audiences through appropriate business, professional and trade associations and that substantial production cost must be anticipated to assure development of high quality, videotaped material designed for a specialized professional audience. However, the large business and professional audiences which were reached and the efficacy of the live/videotaped interactive television format (which is documented below in Part B and in Section Four) indicate impressive energy technology transfer effectiveness data at very modest cost for professionals reached. Assuming that the material to date has directly affected some 2,200 professionals, the cost of the television outreach operation is $71,700 divided by 2,200 or less than $ 33 per professional.

Organizing the Energy Management Seminar Program

Tasks involved in organizing the Energy Management Seminar program included: (i) designing the seminar format, (ii) organizing seminar attendance, and (iii) preparing videotaped informational material.

(i) Seminar Format

The key format decision was that each seminar should consist of a combination of illustrated videotaped interviews with energy authorities in addition to live discussions with the participation of expert panelists and members of the audience.

The decision to videotape interviews in advance afforded several advantages. First, it permitted the conduct of a far greater number of seminars than would otherwise be possible, given the cost and time constraints on the use of nationally recognized energy experts; at the same time it provided a greater number of professionals in the tri-state area with the opportunity to learn first hand the views of these experts. Second, it permitted repetitions, ambiguities, and inadvertent errors in various presentations to be deleted through editing, thereby maximizing informational content in the short space of one seminar. Third, because videotaped materials can be edited at any time, it permitted reuse of materials on subsequent occasions. For example, materials developed for the Winter '76 seminar series were edited to serve as supplements to videotaped materials developed for the June '77 series, and videotaped materials used in both series were edited and restructured into two free-standing video programs available for showing before business, trade, and professional associations, as well as educational institutions, upon request.

Concurrent with the use of videotaped materials, two or three local energy experts were invited to serve as panelists for each day of programming. This decision permitted each seminar to go forth in a personal and spontaneous style. (As far as participants in the outlying studios were concerned, it was often difficult to distinguish between pretaped interviews and live panelists since both came to them over a large television monitor.) The NYIT Energy Referral Service roster proved invaluable in locating energy experts to appear as live panelists.

Table 27 below lists energy experts to appear on videotape in the Winter '76 and the June '77 series. Table 28 which follows lists the live panelists including hosts who participated in the two series. For each seminar series, invitations and program were designed to emphasize the live/videotaped interactive television format.

TABLE 27

VIDEOTAPED ENERGY EXPERTS

Winter '76 Series	June '77 Series
Edwin M. Canuso, Vice President Long Island Savings Bank	Edwin M. Canuso, Vice President Long Island Savings Bank
Jeffrey Cohen, Deputy Commissioner New York State Energy Office	William P. Chapman, P.E., President American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc.
Fred S. Dubin, P.E., President Dubin-Bloome Associates, P.C.	Fred S. Dubin, P.E., President Dubin-Bloome Associates, P.C.
John W. Honeycombe, P.E., Manager Energy Programs Department, IBM	John W. Honeycombe, P.E., Manager Energy Programs Department, IBM
Edwin F. Shelley, Director Center for Energy Policy and Research, NYIT	Donald F. Luebs, Director Building Systems, NAHB Research Foundation
	Edwin F. Shelley, Director Center for Energy Policy and Research, NYIT

TABLE 28

LIVE PANELISTS AND HOSTS

Winter '76 Series	June '77 Series
Panelists:	Panelists:
Chris Ahrens Community Services Administration	Philip P. Agusta, R.A., M.U.P., Vice Chairman, Board of Standards and Appeals City of New York
Carol Ash, Bureau Chief Program Development New York State Energy Office	Jerold L. Axelrod Architect
Fred S. Dubin, P.E., President Dubin-Bloome, Associates, P.C.	Walter E. Blum, A.I.A., Partner Blum and Nerzig Architects
Olindo Grossi, FAIA, Dean Division of Architecture and Arts New York Institute of Technology	Joseph F. Cuba, P.E., Director Research and Technical Service, ASHRAE
John W. Honeycombe, P.E., Manager Energy Programs Department, IBM	Robert A. Horrigan, Associate Director for Technical Programs, Center for Energy Policy and Research
Louis Kwit, Assistant Director Energy Unit, New York City Department of City Planning	John E. Kaufman, P.E., Technical Director, Illuminating Engineering Society
Bruce Morrison, Sales Representative, Owens Corning Fiberglas Corp.	Walter H. Metcalf, P.E., President The Energy Store
Lola Redford, Executive Director Consumer Action Now	Theodore K. Steele, Ph.D., Senior Vice President for Academic Affairs, New York Institute of Technology
David Stillman Parsons, Brinckerhoff, Quade and Douglas, Inc.	Chester T. Vogel, P.E., Past President New York Chapter, ASHRAE
Robert Tannenhaus, Director Energy Unit New York City Department of City Planning	
Steve Varon, Vice President Northeastern Solar Energy Works	

(Table continued)

TABLE 28 (continued)

Hosts:	Hosts:
Robert A. Horrigan, Associate Director for Technical Programs, Center for Energy Policy and Research	Robert A. Horrigan, Associate Director for Technical Programs Center for Energy Policy and Research
Edwin F. Shelley, Director, Center for Energy Policy and Research	Edwin F. Shelley, Director, Center for Energy Policy and Research
Theodore K. Steele, Ph.D.,Senior Vice President for Academic Affairs, New York Institute of Technology	Theodore K. Steele, Ph.D., Senior Vice President for Academic Affairs, New York Institute of Technology
Gale Barbara Tenen, Ph.D. Deputy Director, Center for Energy Policy and Research	

A related format decision concerned developing each seminar to appeal to a variety of target audience categories; namely, architects, engineers, contractors, business persons, facility operators, bankers and public officials. This decision reflects our belief that energy conservation is a "systems problem" involving the emergence of supportive and interrelated activities on the part of a variety of technical and professional leaders. According to this perspective, commitment to conservation would be facilitated among, for example, architects only if supportive actions begin concurrently among engineers, bankers, public officials and the financial community. Thus, the Energy Management Seminar Program was designed to advise various types of professionals not only of latest technical and related developments pertinent to a specific field, but also to allow all parties involved in this "systems problem" to appraise first hand from each other the likely incentives and barriers to conservation within and across professions. To accomplish this end, it was recognized in advance that some degree of technical depth would have to be sacrificed as a means of maintaining the interest of an audience with a wide variety of backgrounds.

(ii) Organizing Seminar Participation

The procedure devised to organize attendance of specialized audiences at the seminars involved working with the appropriate business, professional and trade organizations to develop program content and to recruit seminar participants from among their ranks on an intensive basis.

As discussed in the NYIT Energy Advisory Service Preliminary Project Assessment, June 1 to December 30, 1976, we learned from the first seminar series that a substantial lead time is required for a procedure of this sort to have maximum impact. This is because executive boards of associations often must meet to decide matters relating to extending cooperation to outside groups such as our own. For the first seminar series, our lead time (eight weeks) was simply not substantial enough to wait on such upcoming meetings. Therefore, two weeks prior to the first Winter '76 seminar, a concerted telephone campaign began to convince high level personnel of various specialized professions to attend the seminar themselves along with their colleagues. We followed up each telephone call by mailing a letter of explanation and a sizeable number of invitations for distribution or posting. In all, 450 letters of explanation were mailed in which a total of 11,000 invitations were enclosed. In addition, various association newsletters and mass media outlets publicized the seminar series.

As a result of these activities, 537 individuals called the Center for Energy Policy and Research to reserve a place at one of the ten seminars offered in the Winter '76 series for an average of 54 reservations per seminar.

In contrast to the first series, four months were alloted to work through appropriate associations to organize attendance at the six seminars conducted in June, 1977. The more substantial lead time generated 568 reservations for an average of 95 per seminar or almost double the number of reservations per seminar previously placed.

Under the supervision of the Associate Director for Technical Programs, the procedure for organizing attendance at the June'77 seminar series began in March, 1977. Initial steps involved identifying the names of officials from appropriate professional, trade and business associations. These officials were then contacted through the mail with a five-page letter and over the telephone so they would have enough information to decide whether to include seminar invitations in their regular mailings to members, provide us with the names and addresses of those members who lived in the MRC-TV studio area or include notices of seminar subjects, dates, times, and studio locations in their journals or newsletters. Response to this activity included requests to distribute invitations to members or colleagues from more than 170 national associations or local chapters representing: engineers, architects, contractors, builders, bankers, non-profit groups, consumer groups, government agencies, planners, unions, industry groups and management consultants. More than 3,100 invitations were placed into circulation in this way.

Invitations were sent on an individual basis to the memberships of the American Society of Heating, Refrigeration, and Air-Conditioning Engineers (ASHRAE), the Illuminating Engineering Society and the American Society of Mechanical Engineers using mailing lists provided to us free-of-charge. Professional directories, and the CEPR mailing list were used to provide architects, bankers, contractors and home builders among others with personal invitations sent in envelopes addressed and stuffed by CEPR volunteers and by senior citizens in a local center. The Metropolitan Regional Council sent invitations to their mailing list of public officials, and rather than wait to receive bulk supplies of invitations, one contractor's association reproduced our original five-page letter at their own expense and circulated it to their entire membership. Thus, in addition to the 3,100 invitations put into circulation through associations, more than 6,100 engineers, contractors, architects and public officials were individually invited. In total then, approximately 9,200 invitations were placed into circulation.

The June '77 Seminar series was also publicized by a press release mailed to mass media outlets in the tri-state area, and it was announced in a special 20-page Energy Conservation supplement which the Center for Energy Policy and Research had prepared for distribution with Newsday, Long Island's leading paper, on June 5, 1977. In addition, the Metropolitan Regional Council included the schedule and a "Program Note" describing the seminar series in its June MRC-TV Guide which has a mailing list of over 2,000, and two local radio stations (WINS and WBAI) made public announcements.

(iii) Preparing Videotaped Informational Materials for the June '77 Seminar Series

The videotaped interviews by Edwin F. Shelley and the energy experts identified in Table 27 were produced to professional standards on color cassettes at the television studios of the New York Institute of Technology. For the most part, illustrations, photographs, movie clips and charts used in taping were supplied by the interviewee. The production crew consisted of NYIT studio personnel and CEPR staff.

In March 1977, discussions began concerning the substantive areas to be covered in videotaped informational materials for the June Energy Management Seminar series which was entitled "Energy Conserving Building Design and Solar Energy Applications." Videotaped materials used in the Winter '76 series were also reviewed and logged for the purpose of preparing edited versions. In April and May, agreement was reached with Mr. William Chapman, President of ASHRAE and with the designers of the Minimum Energy Dwelling (M.E.D.), an ERDA-financed project, to be interviewed by Edwin F. Shelley on videotape for showing during the seminar series. The M.E.D. representatives subsequently bowed out due to pressing business matters and instead agreement was reached with Mr. Donald Luebs, Director, Building Systems, NAHB Research Foundation to prepare a videotape segment on the NAHB-HUD Energy Efficient Residence. A number of discussions with Mr. Chapman and Mr. Luebs resulted in consensus on the substance of the interviews and on program outlines. The actual interviews were conducted *ad lib* rather than from a script, and the resultant spontaneity of discussion was most appropriate to the seminar format. A videotaped introduction by Mr. Shelley was prepared to set the seminar program in the context of the national energy situation.

Each interview took one day to produce at the NYIT television studios. Pre-editing of videotaped materials initially used during the Winter '76 series required two days of studio time, and final editing of all segments was completed in three more days. (Similar procedures for the Winter '76 seminar involved videotaped interviews by Mr. Shelley with Fred Dubin, Edwin Canuso, John Honeycombe and Jeffrey Cohen. Program preparation required three days, taping required three days of studio time, and editing required three additional days.)

Conducting the June '77 Energy Management Seminars

The seminars in the June '77 series were conducted in the morning from 10:00 AM to 12:30 PM and repeated before different audiences in the afternoon from 2:00 PM to 4:30 PM on June 15, 21 and 27. Total participants numbered 409 including more than 150 engineers, architects and building contractors, more than 50 legislators, administrators and other public officials and more than 50 representatives from companies which manufacture, distribute or install energy conservation products. The busiest studios were the World Trade Center on June 15, AM and June 21, PM, and Mineola, N.Y. on June 15, AM.

Each seminar presented videotaped informational segments in the order indicated below:

1. Introduction and Background (4 minutes)
2. Energy Management Systems (14 minutes)

3a. Survey of Solar Heated and Cooled Residences (4 minutes)

b. The Energy Efficient Residence (20 minutes)

c. Financing of Energy Conservation (7 minutes)

4. Energy Conserving Building Design (27 minutes)
5. ASHRAE Standards for Energy Conservation (18 minutes)

Live interactive exchanges among panelists, and seminar participants were encouraged following each of the five segments.

With its live/videotaped interactive television format, the seminars proved easy to conduct. "Notes for the Host" were prepared as an effective guide. The "Notes" stressed the importance of advising participants of the live/videotaped seminar format and of providing clear instructions for posing questions over the MRC-TV network particularly for participants in regional studios. Hosts were also instructed to ask participants to complete and return an evaluation questionnaire which had been distributed at each studio location.

Since the Winter '76 and June '77 series shared similar formats special attention was paid to improving the June series by incorporating suggestions which emerged from an analysis of Winter '76 evaluation questionnaires. (See, NYIT Energy Advisory Service Initial Evaluation Report, January 31, 1977, pages 20-23). Constructive comments from the first series had included suggestions that more printed material be provided at studio sites, that live panelists play a greater role, that MRC-TV studio coordinators in outlying areas be more available, and that more time be alloted to live interactive exchanges.

Accordingly, for the June '77 series, we arranged to distribute printed matter detailing the Energy Efficient Residence (Segment 3b), and we encouraged live panelists to present models of their own work illustrating energy conserving residential and commercial building design. In addition, we wrote to each MRC-TV coordinator personally to solicit their cooperation in making the seminar a success and where possible we also arranged to have our own personnel present in regional studios. Finally, we alloted approximately 40% (one hour) of each seminar (2 1/2 hours) to live interactive discussions.

The questions arising during these live interactions were preserved on tape by the MRC-TV technical crew. To illustrate the diversity of concerns which arose in conjunction with each videotaped segment, examples are reconstructed in the Appendix.

Energy Management Seminar Program Spin-off

As a by-product of the initial NYIT/ERDA Energy Management Seminar program, a 55-minute full color program was produced on present day solar energy applications and on related energy conserving building design. Two copies of the program, entitled Solar Energy Today, are available in broadcast format for television airing and 16 copies are available in 3/4 inch video cassette for viewing by educational, professional and governmental organizations. The media and various organizations were advised of this service through a press release and personal letters. Table 29 lists the 61 organizations who have viewed the presentation thus far. In addition, 21 groups have asked to be placed on the six-to-eight-week waiting list for viewing.

As a by-product of the June 1977 Energy Management Seminar program, a 25-minute full color double-feature was also produced describing and illustrating (1) the design and construction of the Energy Efficient Residence by the NAHB Research Foundation and (2) a series of aesthetically interesting residences which incorporate solar energy utilization in the original architectural design. Copies of this program, entitled "Energy Conservation in Residential Construction" are now beginning to be made available to various organizations upon request. On the basis of information provided by sponsoring organizations, we estimate that in addition to the 1,000 professionals to view versions of these tapes during the 16 seminars comprising the Energy Management Seminar Program, another 1,200 professionals have been reached to date by this spin-off activity.

TABLE 29

ORGANIZATIONS WHO VIEWED "SOLAR ENERGY TODAY"

Programming Department of WBZ, Boston, Massachusetts
Programming Department of French TV, New York, New York
Programming Department of WLIW, Channel 21, Garden City, New York
University of Pennsylvania, University Park, Pennsylvania
Construction Specifications Institute, Long Island, New York
Bentel and Bentel Architects, Locust Valley, New York
Philadelphia Electric Company, Philadelphia, Pennsylvania
Suffolk Community College, Selden, New York
Passaic River Coalition, New Jersey
Aaron and Company, Architects, New Brunswick, New Jersey
U.S. Merchant Marine Academy, Kings Point, New York
Publisher, Solar Age Magazine, Port Jervis, New York
Public Service Gas & Electric, Newark, New Jersey
Long Island Lighting Company, Hicksville, New York
NYIT Special Studies Program on Solar Energy, Old Westbury, New York
Suffolk Cablevision, Central Islip, N. Y.
Seacliff Ecology Group, Seacliff, New York
Leroy Hospital, New York, N. Y.
Cambridge Central School, Cambridge, N. Y.
Burke Rehabilitation Center, White Plains, N. Y.
Rutgers University, New Brunswick, N. J.
Suffolk Community College, Selden, New York
St. Luke's Hospital Center, New York, N. Y.
New Jersey Division of Aging, Trenton, New Jersey
Northwest Utilities, Hartford, Conn.
Intech Labs (marketing division), Ronkonkoma, N. Y.
Margaretville Hospital, Margaretville, N. Y.
NYIT Engineering Club, Old Westbury, New York
Citizens for a Better Environment, Little Silver, N. J.
Arnot-Ogden Memorial Hospital, Elmira, N. Y.
Binghamton General Hospital, Binghamton, New York
NYIT Solar Energy Class, Old Westbury, New York
Energy Expo 1977, Albany, New York
Science Fair, Dowling College, Oakdale, N. Y.
Shoreham Nuclear Power Station, New York
Donald H. Adams, Solar, Inc., Connecticut
Wyoming County Community Hospital, New York
Muncies Sanitary Department, Indiana
South Huntington School, Huntington, New York
Brookhaven National Laboratories, New York

(Table continued)

Port Washington Public Library, New York
Dutchess Community College, New York
Environmental Action Coalition, New York
New York University, New York
Southern New England Telephone, Connecticut
President Automation Machinery Dev. Corp., Connecticut
Southern California Edison, California
Chilton Company, Pennsylvania
House Minority Office, Connecticut
Department of Chemistry, Iona College, New York
Department of Education, Jamestown College, North Dakota
Citizens Energy Council, Washington, D.C.
The Science and Screen Report, New York
Griswold High School, Iowa
Congressman Albert Gore Jr., Gallatin, Tennessee
Alternative Energy Sources, Ohio
Engineering Tech. Department, Lansing Community College, Michigan
William Rainey Harper College, Illinois
Statler, Stagg & Assoc., Cape Canaveral, Florida
American Institute of Architects, Washington, D.C.
Citibank, New York, N.Y.

> "Someone commented to me 'that is a very expensive form of discussion.' I personally can see no better way to have that quantity and quality of experience and expertise presented to representatives of groups or professions who will do something with the information."
>
> June 1977 Energy Management Seminar participant (from evaluation questionnaire #229)

Part B

This section will report quantitative and anecdotal data used to examine participant reaction to the June 1977 Energy Management Seminar series and the subsequent impact which the seminar series had on participants' professional lives. The evaluation program designed to cast light on these matters was executed in two waves.

Methodology

In Wave One, questionnaires consisting of structured and open-ended items were distributed at all seminar sites, (see the Appendix). Participants were asked to return the form at the seminar's conclusion either directly to the studio coordinators or to the Center for Energy Policy and Research through the mail.

In Wave Two, an attempt was made to reach the entire population of June 1977 seminar participants(N = 409) with a telephone interview schedule, (see the Appendix).

Wave One activities yielded a rate of return of 235 questionnaires or 57.5% of all attendants. Whenever sampling techniques of this kind are employed, some bias may be expected due to differences among individuals who return questionnaires compared to those who do not. Nevertheless in this case questionnaires were returned in almost equal rates from participants attending each of the three days of programming (35.8% of June 15 attendants, 29.7% of June 21, and 34.5% of June 27) and all audience category types were represented in the sample in percentages roughly approximating their actual numbers. (For example, 57% of the respondents were either architects, engineers, builders or other representatives of energy-influential industries and businesses.)

Wave Two activities began in December 1977--six months after the final seminar in the June series. Two sweeps were made of the entire universe of seminar participants yielding a total of 175 successful contacts or 42.8%. Within margins of error established by sampling theory, conclusions arising from data analysis can be generalized with some confidence.

Wave One analysis provided data to answer the questions:

(i) In terms of demographics and prior energy attitudes, what kinds of professionals attended the June Energy Management Seminar series?

(ii) What were their impressions of the presentation?

(iii) Did the seminar impart new learning experiences and new or renewed intentions to act?

Wave Two analysis provided data to examine the questions:

(i) Was the value of the seminar lasting enough to still be in evidence six months later?

(ii) Had the information provided during the seminar been incorporated into professional practices and/or procedures?

Wave One Analysis: Questionnaires

(i) Who Participated in the Seminar Series

Seminar respondents were male (90.9%, N = 210) and median age 33. More than half (51.6%, N = 116) had completed four years of college and another 28%(N = 63) had graduate and professional school training. Incomes in the $20,000-$30,000 range were earned by 37% (N = 78) and substantial numbers were in higher income brackets.

Participants were asked "would you be in a position to personally influence whether your place of work undertakes energy conservation measures." Of all seminar respondents, 81.1% (N = 176) indicated that they would have such authority.

Table 30 describes the various mechanisms through which respondents came to learn about the seminar (primarily through invitation) and Table 31 indicates that the most frequently cited reason for attending was a basic interest in the subject (66.2%). It is of some consequence to note that 4.1% said they were particularly attracted by the innovative nature of an interactive television format.

TABLE 30

SOURCES OF SEMINAR AWARENESS

Sources	N	%
Invitation	148	64.9
Personal contact from CEPR staff	5	2.2
Word-of-mouth	13	5.7
In-house trade, professional, business publications	15	6.6
Mass media	29	12.7
New York Tech Energy Hot Line	1	0.4
From others	11	4.8
Other	6	2.7
	228	100.0%

TABLE 31

REASONS FOR ATTENDING

Reasons	N	%
Basic interest in subject	147	66.2
Job requirement	53	23.4
To meet new contacts	1	0.5
Innovative nature of format	9	4.1
To assess seminar for colleagues	6	2.7
Other	6	2.6
	222	100.0%

Concerning energy-related attitudes, almost 60% of seminar respondents felt that energy supplies would be in severe shortage in ten years, and sizeable numbers were strongly inclined towards energy conservation as a solution to current problems. That is, when seminar respondents were asked to judge ten possible strategies for solving U.S. energy problems--each independently on a scale from "1" to "5"--63.8% gave "using energy more wisely" the highest possible rating of "5". As Table 32 indicates, no other solution received as large a percentage of highest ratings. (For a comparison of how Hot Line users rated similar strategies, see Table 18, page 48.)

TABLE 32

PERCENTAGES AND RANK ORDER OF SEMINAR RESPONDENTS WHO GAVE HIGHEST RATING TO VARIOUS ENERGY SOLUTIONS

Solutions	%	Rank Order
Using energy more wisely	63.8	1
Developing solar energy	53.5	2
Federal government	47.4	3
Concerned people	42 4	4
Getting more information to people	41.9	5
Scientists	41.0	6
State and local government	33.6	7
Developing nuclear fusion	29.1	8
Oil companies	17.2	9
Developing nuclear fission	13.9	10

(ii) Participant Impressions of June Energy Management Seminar Series

Seminar respondents were asked to judge several features of the Energy Management Seminar program independently from "1" to "5" with "5" representing the best response. Table 33 matches the nine features under analysis with the percentages of respondents to accord each either a "4" or a "5" rating.

TABLE 33

PERCENTAGES OF SEMINAR RESPONDENTS WHO GAVE VARIOUS SEMINAR FEATURES TOP RATINGS

Features	N	%
Opportunity television seminar provided for broad exchange of ideas	137	59.6
Opportunity television seminar provided to disseminate technical information	154	67.3
Energy Management Systems segment	117	52.5
Survey of Solar Heated and Cooled Homes segment	87	39.9
The Energy Efficient Residence segment	150	65.8
Financing Energy Conservation segment	51	23.3
Energy Conserving Building Design segment	176	76.5
ASHRAE Standards for Energy Conservation segment	162	73.3
Contribution of live panelists	95	44.4

As this table shows, the seminar features receiving highest marks were the taped segment on Energy Conserving Building Design presented by Fred Dubin, the taped segment on ASHRAE Standards for Energy Conservation presented by William Chapman and the overall opportunity the seminar provided to disseminate technical information on energy conservation.

Space was provided on the evaluation questionnaire for seminar participants to provide candid, open-ended comments. Almost 70% of the respondents (N = 162) composed one or more remarks which basically revolved around four topics.

The most popular topic for commentary concerned extended comments of praise (35.2%). Common phrases used to describe the seminar included: "excellent," "great," "very good and interesting," "efficient and broad," "it works well," "informative," and "most helpful." Many comments placed particular emphasis on the opportunity afforded by the seminar to share information among associates, on the energy-saving format of the seminar itself (in terms of time and travel saved by attending at nearby studios) and on how interactive television might be employed more extensively for energy conservation information dissemination. What follows are examples of unedited comments of this sort which were offered by attendants with varying professional backgrounds:

> --"Has a good effect in keeping those dealing in the field apprised of the general feelings of their associates as well as a bank of information with regard to efficiency and cost effectiveness of the various installations." (Mechanical/Electrical Engineer)
>
> --"Very effective, enabling a very select panel and set of movies to be viewed by a wide audience. This was my first experience with the scheme." (Consulting Engineer)
>
> --"I found the system excellent. It was my first experience! Don't know how you could get such qualified panelists etc. to so many people. Found it a shame that so few participated." (Architect)
>
> --"Professionals from many backgrounds can test thoughts and ideas by asking their colleagues various questions." (Student)
>
> --"This system provides a chance to edit the material provided so that repetition of information is eliminated. Condensed version of a good presentation is very helpful." (Architect)
>
> --"I feel it is an excellent means of communicating a wide range of ideas in a short span of time." (Salesman)
>
> --"Excellent to get diverse information and concern from various sources and various interests and backgrounds." (Designer)
>
> --"Interactive television is means to bring more information to a group in the limited time available. Also more experts' views can be obtained." (Plant Engineer)
>
> --"Is very good - saves cost and travel time to meetings." (Builder)

--"Good. More use in evenings." (Plant Manager/V.P.)

--"I believe this method is a good way to disseminate information. Perhaps detailed "courses" could be offered using this media." (Engineer)

--"This seminar was an excellent way of obtaining opinions from a variety of people in several communities in the New York area. A wider range of opinions and ideas may be obtainable by having the seminar encompass more than just the New York Metropolitan area." (Electrical Engineer)

--"Suggest using this on a level with professional societies - during their regular meeting - as a special event!" (Salesman)

A related topic of commentary (17.4%) involved explicit or implied comparisons between the educational benefits of interactive television seminars versus other methods of instruction. The interactive television method came out ahead in 75% of all such comparative statements for various reasons which the following unedited examples highlight:

--"Someone commented to me 'that is a very expensive form of discussion.' I personally can see no better way to have that quantity and quality of experience and expertise presented to representatives of groups or professionals who will do something with the information. I would like an update-repeat in, say, six months." (Public Relations expert)

--"By using the television screen as a conveyor of thought and ideas, plus examples, it can be visually understood by all the viewers. It has a greater impact to all, rather than listening to a speaker." (Architect)

--"T.V. illustrations and commentors present fast and greater variety than another in single magazine or newspaper articles." (Testing Engineer)

--"Information was communicated easily with lack of interference that large seminar groups often produce." (Architect)

--"It is an excellent concept of method to incorporate informative lectures with the usual impact of actual exhibits to impart to the viewer the full value of proposed subjects." (Architect)

--"Excellent idea, saves time in that it can cover much more in a short time than the person-to-person type seminar; panel can be plainly heard; less chance for interruptions during presentation. Disadvantages: technical difficulties and inexperienced T.V. network personnel at our location prevented our participation for some time. More time should be alloted for Q & A periods." (Engineer)

--"Specific publications more efficient" (President of construction company)

--"I think the seminar would work much better if held in one place. The use of T.V. takes away the effect of seminar." (Student)

A third area of commentary (33.9%) offered constructive suggestions for improving the seminar. These included comments about seminar breadth, attendance level, availability of supplemental reading materials, the role of panelists, and the time alloted to live interactive question and answer periods. Examples follow:

--"Believe it to be an excellent method particularly for technical meetings where the scope is narrowed and the participants are interested in more specific subjects." (Consulting Engineer)

--"I think it's a good idea so we can also reflect our views. I did, however, expect a larger turnout." (Salesman)

--"I felt it was quite beneficial but I could have used more printed information." (Owner and operator of solar construction company)

--"It is a useful tool. Brief write-ups on the subject matter discussed by the speakers should be available to attendents upon request only." (Engineering consultant)

--"Excellent idea. But felt the panel was not able to contribute due to time required by taped segments. Would like to have longer inter-active conversation segments for sharing ideas." (Architect-designer)

--"One criticism - the live panelists although knowledgeable in their fields were unable to answer specific questions regarding the tapes. It would have been better to show fewer tapes and have on the live panel people who were directly involved with the subject. i.e. Don Luebs of NAHB did a commendable job but nobody could answer specific questions re the EER house." (Architect)

--"Not particularly effective for interaction - it was effective for simultaneous viewing to receive information." (Bank Executive)

--"Allow more time for question and answers." (Architect)

In the final area of commentary (10%), references were made to distracting technical problems with the MRC-TV system and to shortcomings on the part of studio coordinators affiliated with MRC operation. (MRC-TV coordinators are county employees who normally have a number of other assignments in addition to their responsibilities in the MRC-TV regional studios.)

> --"Good idea, but, as some say about solar, not effective until you clear up your technical problems. (Specifically, lighting and sound). Value seems to be in savings of transportation time and energy over holding a centralized meeting." (Consultant)
>
> --"Good - when one becomes accustomed to talking to a machine." (Contractor)
>
> --"This idea is good. Technical details such as poor lighting of attendees could be improved for T.V." (Application specialist for pumps and heat exchangers)
>
> --"Basic format excellent - however local coordinator did a poor job." (Facilities Engineer)

Participants' impressions of the seminar were also measured in terms of absolute and relative credibility because the trustworthiness of a source of information has often been found to influence the effectiveness with which it can be used to transfer information. In rating the Energy Management Seminar from "1" to "5" as a reliable source of energy information, 59.5% of the respondents gave it either a "4" or a "5"--the highest ratings. Respondents were also asked to similarly rate nine other more conventional sources of information. Of these, only professional journals outdistanced the credibility of the seminar. Table 34 presents these results and rank orders sources of information in terms of highest credibility. (For a comparison of how Hot Line users rated the credibility of similar sources of information, see Table 20, page 54.)

TABLE 34

PERCENTAGES AND RANK ORDER OF SEMINAR RESPONDENTS WHO GAVE HIGHEST CREDIBILITY RATINGS TO VARIOUS SOURCES OF ENERGY INFORMATION

Sources of Information	%	Rank Order
Professional journals	80.0	1
NYIT/USERDA Energy Management Seminar	59.5	2
Federal government	46.1	3
Network TV and radio	23.7	4
Newspapers	22.0	5
Friends and family	12.4	6
Public utilities	10.2	7
Oil companies	6.7	8
Local politicians	5.1	9
National politicians	3.9	10

(iii) Impact of June Energy Management Seminar Series on Participants

The questionnaire instrument utilized in Wave One seminar analysis contained measures designed to tap the effectiveness of the seminar program for energy technology transfer. Just as in Wave One Hot Line analysis, energy technology transfer was operationally defined in terms of assertions participants made (a) regarding improvements in their knowledge about energy conservation techniques and (b) regarding their intention to act in respect to energy technology utilization.

The KNOWLEDGE variable was measured by having respondents indicate if their participation in the seminar improved their knowledge about energy conserving building design and solar energy applications "a lot," "somewhat," or "not at all." As Table 35 reports, based on the options chosen by an overwhelming majority of respondents (96.4%), one could say that the seminar was a successful educational experience.

TABLE 35

SEMINAR RESPONDENTS IMPROVED KNOWLEDGE

Response	N	%
A lot	60	26.8
Somewhat	156	69.6
Not at all	8	3.6
	224	100.0%

In addition, respondents were asked to give examples of areas in which their knowledge had been improved; 364 discrete references were made. The most frequently cited references dealt with residential conservation including heat pumps (31.6%), solar energy utilization (23.6%), energy conserving new building design (21.7%), and commercial retrofit and energy management (11.8%).

INTENTION TO ACT was measured by three questions. First, respondents were asked,"if energy conservation were largely up to you, how likely do you think it would be that you will act on any of the suggestions made in this seminar?" Table 36, which follows, shows that 97.4% reported action would be "very likely" or "likely."

TABLE 36

LIKELIHOOD OF ACTION IF DECISION UP TO SEMINAR RESPONDENT

Likelihood	N	%
Very likely	181	78.4
Likely	44	19.0
Unlikely	3	1.3
Very unlikely	3	1.3
	231	100.0%

Second, respondents were asked to state in their own words "why" they would be likely to act. A wide variety of reasons, often quite revealing, were cited; and for the purposes of analysis, they were organized into the eight categories reported in Table 37.

TABLE 37

REASONS MAKING ACTION LIKELY

Reasons	N	%
Concern with economics/saving money	84	35.4
General importance of conservation including concern with dwindling supply	64	27.0
Profession involved in conservation	41	17.4
Moral imperative to use professional role to set model for others; to help maintain standard of living, to look out for next generation	24	10.1
Committed to conservation on a personal level	8	3.4
Concerned for the country (patriotism, independent foreign policy)	6	2.5
Committed to eliminating waste of any sort	6	2.5
Other	4	1.7
	237	100.0%

The final measure of INTENTION TO ACT concerned a yes/no answer to the direct question: "Would you act on suggestions made specifically during the seminar: "73.8% (N = 149) replied "yes;" and 29.2% (N = 53), "no." When respondents were asked to specify the areas in which they would act, the most frequently mentioned areas concerned residential conservation (40.9%), energy conserving building design modifications (18.5%), solar energy applications (13.5%) and commercial retrofit and energy management systems (12.5%).

Additional analysis of Wave One data was directed towards more closely defining the circumstance or conditions under which the seminar program had a greater or lesser chance of being effective. Contingency table analysis or two-variable cross tabulations were selected as the statistical procedure for examining whether seminar effectiveness measures tended to vary in such a way that participants at the outlying studios learned more from the seminar or felt more compelled to act than participants in World Trade Center. A chi square (x^2) test of significance associated with the cross tabulation procedure makes it possible to determine whether the relationship is statistically significant and not due solely to random chance.

Tables 38 and 39 below present cross tabulations between respondents' studio location (World Trade Center versus outlying studios) and both seminar technology transfer effectiveness measures of KNOWLEDGE and LIKELIHOOD OF ACTION.

TABLE 38

THE RELATIONSHIP BETWEEN STUDIO SITE AND KNOWLEDGE

Improved knowledge	Studio Site	
	World Trade Center	Outlying Studios
A lot	22.2	27.4
Somewhat	77.8	68.3
Not at all	0.0	4.3
	100.0%	100.0%
	(36)	(186)

TABLE 39

THE RELATIONSHIP BETWEEN STUDIO SITE AND LIKELIHOOD OF ACTION

Intention to Act	Studio Site	
	World Trade Center	Outlying Studios
Likely	94.6	97.9
Unlikely	5.4	2.1
	100.0%	100.0%
	(37)	(192)

The first relationship (x^2 = 2.24466, 2 d.f., p = not significant) shows that 27.4% of the participants attending one of the outlying MRC-TV studios reported learning "a lot" of new ways to conserve compared to 22.2% of those at the World Trade Center. The same pattern obtains in the next relationship (x^2 = 1.99234, 1d.f., p = not significant) where 97.9% of the outlying studio participants project "likely" energy conserving actions versus 94.6% at the World Trade Center. Thus, even though these relationships are not statistically significant, it would appear that participants performed better on the measures of energy technology transfer effectiveness if they attended the seminar in Long Island, Westchester, New Jersey or Connecticut than in Manhattan--the broadcast site.

Several explanations are possible. For example, since participants at the World Trade Center at once experienced conditions associated exclusively with the interactive television network and with conventional seminars where there is face-to-face contact between seminar leaders and their audience, the distraction arising from the contrast may have diminished the presentation's impact.

For whatever its reason, this finding (which also emerged with statistical significance in analysis of the Winter 1976 Energy Management Seminar series as reported in NYIT Energy Advisory Service Initial Evaluation Report, January 31, 1977) adds credemce to the belief that interactive television seminars can be a highly effective means of transferring energy technology to many hundreds of professionals distributed over a wide area who have to travel only a few miles to a nearby studio location.

The data analyzed in Wave One analysis was obtained from seminar participants immediately after the seminar's conclusion. While these data reveal that the seminar imparted new areas of knowledge and facilitated new and renewed intentions to act, a second wave of analysis, discussed in the next section, was initiated six months later to assess the lasting impact of the seminar including the maintenance or waning of initial enthusiasm for action.

Wave Two Analysis: Follow-up Telephone Interviews

As previously described, Wave Two evaluation activities began in December 1977--six months after the final seminar in the June 1977 series. An attempt was made to reach the entire population of seminar participants (N = 409) over the telephone using names and addresses available from attendance sheets filled out at each studio site. After two sweeps of all attendants, successful contact was made with 175 participants. It is possible to assess the value of the seminar series over time because, of the 175 participants interviewed, 117 (66.9%) had also voluntarily completed the questionnaire associated with Wave One analysis.

(i) Value of the Seminar Over Time

The telephone interview schedule contained replications of previously employed measures of seminar effectiveness for energy technology transfer. In this case, the KNOWLEDGE variable was measured by response to the question, "Would you say that the seminar influenced your thinking or knowledge about energy conservation and solar energy applications in any way?" Of all telephone interviewees, 70% (N = 114) replied, "yes;" and 30% (N = 49), "no."

In order to examine the relationship between scores on this measure and scores on the KNOWLEDGE variable included in the Wave One questionnaire (see Table 35, page 86), a Pearson product-moment coefficient of correlation was calculated. The possible values of this statistical measure, which is abbreviated as "r," can range from -1.00 through 0.00 to +1.00. A zero r value would mean that scores on two measures are not related at all: individuals who score high on KNOWLEDGE improvement in the questionnaire, tend to score low, moderate, or high when the measure is repeated six months later. A negative r value would mean that the relationship between the two scores is inverse: individuals who score high on the KNOWLEDGE variable in the questionnaire tend to be low on the KNOWLEDGE variable measured in December. Only a positive r value would suggest that the seminar had lasting impact on participants as far as their own assertions were concerned regarding improvements in knowledge. Correlation analysis between scores on questionnaire measures of KNOWLEDGE and follow-up telephone measures of KNOWLEDGE reveal that r = +0.23, which is a moderate, positive correlation, statistically significant at the .008 level.

Evaluation of the seminar's overall IMPACT or influence remained high despite the passage of time. That is, when interviewees were asked, "Overall, if the influence of the seminar were to be rated on a scale from 1 to 7, with 7 representing the greatest impact, what score would you give the presentation?" , 35.6% awarded the seminar a "5 ;" 8.1%, a "6;" and 5.6% ; a "7." Table 40 summarizes results.

TABLE 40

OVERALL IMPACT OF SEMINAR MEASURED ON A 7-POINT SCALE

	Scale value	N	%
lowest	1	9	5.6
	2	14	8.7
	3	22	13.7
	4	36	22.6
	5	57	35.6
	6	13	8.2
highest	7	9	5.6
		160	100.0%

Furthermore, participants who had been impressed with the seminar in June tended to maintain their evaluations six months later. That is, in the Wave One questionnaire, respondents had been asked to judge nine features of the Energy Management Seminar independently from "1" to "5" with "5" representing the best response. The two features most akin to the 7-point scale used in the telephone interview schedule were "opportunity the television seminar provided for a broad exchange of ideas," and "opportunity the television seminar provided to disseminate technical information." Table 41, which presents the results of correlation analysis on the 7-point scale and each of these two features, indicates two r values which are positive and statistically significant at the .025 level.

TABLE 41

PEARSON CORRELATIONS BETWEEN 7-POINT IMPACT SCALE AND OPPORTUNITY TO EXCHANGE IDEAS AND OPPORTUNITY TO DISSEMINATE INFORMATION

	Exchange Ideas	Disseminate Information
Impact	r = +0.19 p = .025 (N = 107)	r = +0.19 p = .025 (N = 013)

(ii) Seminar Information Incorporated Into Action

In the interview schedule, ACTION was measured by response to the question, "Would you say that because of what you learned at the seminar, you or your firm have begun to take new actions or adopt new practices concerning energy conservation or solar energy applications?" Table 42 reproduces results and shows that a total of 48.4% indicated they have taken action and plan to do more.

TABLE 42

SEMINAR INTERVIEWEES' ACTION STATUS

Action Status	N	%
Have already acted	59	37.1
Have already acted and will act more	18	11.3
Will act	3	1.9
Won't Act	79	49.7
	159	100.0%

That 48.4% should assert that they have already begun acting is a persuasive sign of seminar effectiveness, but this percentage does represent a decline when compared to scores on the INTENTION TO ACT measure utilized in the June questionnaire. Then a total of 78.4% of respondents had said that action would be "very likely," (see Table 36 , page 86). The correlation between scores on these two measures also reflects this attrition with r = +0.15 which is a slight, statistically insignificant, positive correlation.

Additional questions were posed during the telephone interview to establish more clearly the factors affecting maintenance and ebbing of initial enthusiasm for action. Probing of only those who indicated that they had already acted revealed that their actions primarily involved either passing information acquired at the seminar along to others with whom they interact on a professional basis (28.3%, N = 13) or affecting some changes in company practices and operating procedures (56.5%, N = 26). To accomplish these activities, 34.1% (N = 14) said a money outlay was required which a majority,in turn, expected would be recouped in reduced energy costs. 22.2% (N = 6) also stated that they were convinced that involvement in energy conservation would generate new sources of income and business at their places of work.

Those who responded negatively to the ACTION measure (49.7%, N = 79) were also queried about their reasons. As Table 43 presents, a popular explanation suggests that some participants had come to the seminar with no other purpose in mind than to become more conversant about energy. Others came ready to act, but the test of time found them remarking that the seminar either did not adequately address their needs or offered suggestions which were not specific or technical enough to be put into practice.

TABLE 43

SEMINAR INTERVIEWEES REASONS FOR INACTION

Reason	N	%
Came for new information only	20	25.3
Information not pertinent to particular situation	35	44.3
Information not specific/technical enough	16	20.3
No response	8	10.1
	79	100.0%

Summary

The results of Wave One and Wave Two analysis indicate that the June 1977 NYIT/USERDA Energy Management Seminar series attracted professionals who had the authority to initiate energy conservation changes in their places of work and that the series was favorably received in terms of several distinct features including credibility. In participants' estimations which were arrived at both immediately and six months later, the seminar imparted new knowledge and intentions to act. Within the space of half a year, almost half of the participants reported that information provided during the seminar had already been converted into energy conservation practices. By all accounts, then, it can be said that the Energy Management Seminar Program was an effective means of transferring energy technology.

Cost-to-Savings-Ratio

The total NYIT Energy Advisory Service cost from initiation on June 1, 1976 to termination on February 28, 1978 amounted to $315,000. The Energy Management Seminar Program which consisted of ten seminars in Winter 1976 and six seminars in June 1977 was operated at a cost of approximately $71,700.

Activities were directed towards contrasting the total cost to operate the Energy Management Seminar Program with the dollar-value of participant's energy savings attributable to the seminars. These were to be accomplished through use of the follow-up telephone interview which asked participants, who indicated they had already taken action, to specify what had been done and to detail associated expenses. As it turned out, a sizable number of participants (28.3%) took action which involved relaying information obtained from the seminar to others with whom they interact in a professional capacity. For example, many architects who attended the seminar stated that they have begun on a regular basis to discuss energy conscious design principles with clients. Actions of this sort--laudable in their own right and completely in keeping with the seminar's objectives--cannot be easily assigned a dollar value. Thus the type of action many participants undertook precluded the calculation of a meaningful cost-to-savings ratio for the program. However, by virtue of the favorable comparisons which seminar participants volunteered in evaluation questionnaires concerning the educational benefit of interactive television seminars versus other methods of instruction (see page 82) and by virtue of the impressive performance of the seminar series on all measures of energy technology transfer effectiveness, it would seem reasonable to assume that the money spent to operate this program will return many times over in major savings in energy consumed directly by the 1000 participants and their organizations, and indirectly by virtue of the multiplier effect on the general public which a momentum towards conservation among professionals and decision-makers most assuredly produces.

SECTION FOUR

COMPARATIVE ANALYSIS: NEW YORK TECH ENERGY HOT LINE AND JUNE 1977 NYIT/USERDA ENERGY MANAGEMENT SEMINAR SERIES

Under terms of the Energy Advisory Service contract, the Center for Energy Policy and Research has conducted a comparative evaluation cf the New York Tech Energy Hot Line and the June 1977 interactive television NYIT/USERDA Energy Management Seminar series to determine the relative effectiveness of each for energy technology transfer.

Normally comparative analysis is most profitably applied when the phenomena under examination share common elements. One element shared in common between the Hot Line and seminar program was that both to varying degrees offered assistance to architects, engineers, builders, business persons, bankers, educators, public officials and media persons (hereafter referred to as professionals). As indicated in previous sections, whereas 66.5% of Hot Line users were homeowners, 35.5% were professionals, and for all practical purposes, 100% of June Energy Management Seminar participants were professionals. Thus a comparative study was mounted to determine the relative effectiveness which the Hot Line and seminar program had for transferring energy technology to professionals.

Energy technology transfer was measured according to scores obtained on three variables contained in a telephone interview schedule:

(1) KNOWLEDGE IMPROVEMENT: "Would you say that the seminar/Hot Line influenced your thinking or knowledge about energy conservation and solar energy applications in any way whatsoever?"

(2) IMPACT ASSESSMENT: "Overall, if the influence of the seminar/Hot Line were to be rated on a scale from 1 to 7 with 7 representing the greatest impact, what score would you give the program?"

(3) SUBSEQUENT ACTIVITY: "Would you say that because of what you learned at the seminar/from the Hot Line you or your firm have begun to take any new actions or adopt any new practices concerning energy conservation or solar energy applications?"

Hypothesis

Evidence accumulated over the twenty-one month Energy Advisory Service program pointed to the possibility that at the instant when professionals use the Hot Line they are nearer to the brink of taking energy conserving actions than their colleagues who participate in seminars.

For example, there was a qualitative difference between the types of questions professionals posed to the Hot Line and the questions seminar participants posed during interactive discussion periods. On the one hand, Hot Line users asked questions of such complexity that the back-up facilities of the NYIT Energy Information Center/Referral Service were often called into play (see pages 28, and 41). According to Hot Line operators, they often had the impression that such callers were in the throes of implementation planning where time is of the essence. On the other hand, however, an inspection of seminar participants' queries (which are reconstructed in the Appendix) reveals that many were on a rather general level.

Further, when seminar evaluation questionnaires provided space for participants to record their reasons for attending, the most common response (66.2%) involved comments noting only "a basic interest in the subject." (see Table 31, page 78). Remarks of this sort, of course, do not preclude immediate readiness to take action, but on the surface at least, they more readily convey the opposite sense.

Finally, if the amount of initiative demonstrated on behalf of conservation is a sign of more advanced commitment, then additional evidence can be found to support the view that professionals who used the Hot Line started out more primed towards action than seminar participants. In the last analysis, use of the Hot Line by professionals (and homeowners as well) is dependent entirely upon the individual's own initiative in placing a call; whereas no matter how sizable the initiative professionals displayed by attending a seminar in a near-by studio, it was nevertheless an initiative nurtured by receipt of high quality, personal invitations bearing impressive credentials (U.S. Energy Research and Development Administration, New York Institute of Technology, Metropolitan Regional Council), and by inducements proffered by professional associations which assisted the Center in audience recruitment.

This difference among professional users of energy outreach programs may have important consequences. *If two outreach programs are both well designed, credibly operated and favorably received, but if users of one are more advanced in their action intentions than users of the other, then it follows that those who experience the former should perceive themselves to be more adequately serviced than those who avail themselves of the latter.* Since evidence, previously reported, shows the Hot Line and seminar series to be successful programs, it was hypothesized that on all measures of energy technology transfer, professionals who use the Hot Line should demonstrate statistically significant higher scores.

Procedure

Data to test the hypothesis for seminar participants was gathered with the Wave Two follow-up telephone interview schedule previously described in Section Three (see also, the Appendix). In December 1977, an attempt was made to reach the entire population of June 1977 seminar participants (N = 409) with this instrument, but after two sweeps, successful contact was established with 175 or 42.8%.

To gather data on Hot Line professionals, the follow-up telephone interview was modified by merely substituting the words, "Hot Line" where previously "Energy Management Seminar" appeared. This revised telephone interview was administered in December 1977 and January 1978 to professionals who called the Hot Line at approximately the same point in time when the seminar series was in progress. Activities which were directed towards contacting the entire universe of these professionals (N = 120) yielded a completion rate of 30% or 36 interviews. It would have been easy to enlarge the Hot Line sample by polling without regard to month of the year. However, by restricting comparisons to professionals who contemporaneously experienced both programs, it was possible to effect a degree of control over possible confounding factors which is unusual for evaluation research which must be conducted in natural settings.

Data

The interview instrument revealed additional evidence to support the view that professionals use the Hot Line at a point in time when they are nearer to considering action than are seminar participants. That is, a higher percentage of Hot Line users said that prior to June their places of work were already involved in conservation activities (85.7% versus 77.6%); and more Hot Line users said that they had personal authority to suggest or influence the future course of conservation at work (82.9% versus 78.2%). Comparing explanations offered by those seminar participants and Hot Line users who failed to act, we find that 28.2% of the former versus 0% of the latter volunteered the reason that they came only to become more conversant about energy.

The hypothesis was tested by preparing cross tabulations between utilized outreach program (Hot Line versus seminar) and (a) KNOWLEDGE IMPROVEMENT--Table 44, (b) IMPACT ASSESSMENT--Table 45 and (c) SUBSEQUENT ACTIVITY--Table 46.

TABLE 44

THE RELATIONSHIP BETWEEN UTILIZED OUTREACH PROGRAM AND PROFESSIONALS' KNOWLEDGE IMPROVEMENT

Knowledge Improvement	Utilized Outreach Program	
	Seminar	Hot Line
Yes	69.9	72.7
No	30.1	27.3
	100.0%	100.0%
	(163)	(33)

TABLE 45

THE RELATIONSHIP BETWEEN UTILIZED OUTREACH PROGRAM AND PROFESSIONALS' IMPACT ASSESSMENT

Impact Assessment	Utilized Outreach Program	
	Seminar	Hot Line
Low	28.1	22.6
Moderate	58.1	41.9
High	13.8	35.5
	100.0%	100.0%
	(160)	(33)

TABLE 46

THE RELATIONSHIP BETWEEN UTILIZED OUTREACH PROGRAM AND PROFESSIONALS' SUBSEQUENT ACTIVITY

Subsequent Activity	Utilized Outreach Program	
	Seminar	Hot Line
Have acted	37.1	41.2
Will and have acted	1.9	0
Will act	11.3	29.4
Won't Act	49.7	29.4
	100.0%	100.0%
	(159)	(34)

As the first table shows, professionals who used the Hot Line, while not differing from seminar participants in KNOWLEDGE IMPROVEMENT in a statistically significant sense (x^2 = .01231, 1 d.f., p = not significant), demonstrate the predicted tendency to assert greater knowledge advancement. That is, 72.7% of Hot Line professionals responded "yes" to this measure compared to 69.9% who attended the seminar.

The next table, examining the energy technology transfer measure of IMPACT ASSESSMENT, shows that 35.5% of Hot Line professionals versus 13.8% of seminar participants gave their respective programs highest ratings in overall impact. The relationship is in the hypothesized direction and is statistically significant at the .01 level (x^2 = 8.61936, 2 d.f.).

Finally, Table 46 also finds the predicted pattern of greater subsequent action for Hot Line professionals in a statistically significant relationship (x^2 = 9.57971, 3 d.f., P = .02). That is, 41.2% of Hot Line users said they have already acted on information they received versus 39.0% (37.1% + 1.9%) of seminar participants; and 29.4% of the former versus 11.3% of the latter indicated future plans.

Conclusions

If architects, engineers, public officials and other types of professional and technical leaders who are ready to act had to choose between calling the Hot Line or attending the seminar, this study suggests that they would utilize the former. By doing so, they could telephone a reliable source, discuss their particular requirements and receive an immediate answer to their questions rather than taking the time to attend a seminar which may or may not elicit the particular information they want.

On the other hand, by considering two facts together, the importance of the seminar is underscored:

(1) According to Hot Line log forms, the most effective mechanism (42.6%) for generating professional use of the Hot Line was various staff activities including primarily the Energy Management Seminar Program where the availability of the Hot Line service was announced. (See Table 13, page 40 and Table 14, page 41).

(2) According to seminar interview forms, almost half of the participants actually began some energy conservation actions sometime within the space of six months after the seminar. (See Table 42, page 92).

These findings suggest that the seminar may whet the professional's interest, and in time bring him or her closer to considering action. Once this movement begins, professionals might find a need for immediate, practical and up-to-date information, and thus avail themselves of the Hot Line service.

In conclusion, these data reveal that the New York Tech Energy Hot Line was relatively more effective than the NYIT/USERDA Energy Management Seminar series in transferring energy technology to professionals who were nearing readiness to act, whereas the Energy Management Seminar may take credit for assisting professionals to reach the stage of action readiness.

SECTION FIVE

OVERALL PROGRAM EVALUATION

This section will contain information pertaining to (1) management and staff structure, (2) publicity program and activities, (3) general staff activities, (4) external relations with other programs, agencies and institutions, (5) allocations of time and resources to program start-up and implementation according to the 21-month Energy Advisory Service budget, and (6) general observations and recommendations on the design and implementation of a National Energy Extension Service based on our operating experiences.

Management and Staff Structure

The Energy Advisory Service management staff consisted of a Director who established policy, made crucial administrative decisions and directed publicity activities. Day-to-day administrative requirements were handled by a Deputy Director who was responsible not only for coordinating staff activities through direct supervision and bi-weekly staff meetings, but for designing evaluation methodology on the effectiveness of energy outreach programs and for completing documentation to that effect. An Academic Liaison Committee, consisting of four senior officials of the New York Institute of Technology, was important in providing program consultation and in facilitating the use of academic staff in developing particular elements of the outreach program.

The individual outreach programs of the Energy Advisory Service were supervised by members of the professional staff according to their specialties: the NYIT Energy Information Center by a trained librarian and information system specialist; the New York Tech Energy Hot Line by a recent college graduate trained in communications; and the Energy Management Seminar Program and the NYIT Energy Referral Service by an industrial engineer. Although specific responsiblity for each of these programs was placed with one person, each of the specialists relied on one another's expertise and cooperation for successful program operation.

The professional staff was assisted by 17 Staff Associates from the NYIT faculty who were on call, and by the part-time paid and volunteered support of a community-relations specialist, an assistant librarian, and 53 Hot Line paraprofessionals. A distinguished Policy Advisory Council was established by the Center for Energy Policy and Research to improve program leverage and to provide guidance as needed in particular program areas.

TABLE 47

CENTER FOR ENERGY POLICY AND RESEARCH STAFF

Edwin F. Shelley (AB, BSEE), *Director*
Engineering Systems, Communications Management

Gale Tenen Spak (Ph.D), *Deputy Director*
Political Science, Psychology and Communications

Gloria Magat (M.L.S.), *Associate Director, Information Services*
Library and Information Science

Robert A. Horrigan (B.A., B.S.), *Associate Director, Technical Programs*
Economics and Industrial Engineering

Gilbert L. Bardige (B.F.A.), *Manager, Student Liaison*
Communication Arts

Ricki Polisar (M.A.), *Community Service Liaison*
American History, Education

Staff Associates (Senior Faculty Members of N.Y.I.T.)

*Theodore K. Steele (Eng.Sc.D.): Mechanical Engineering, Management (Licensed Professional Engineer)
*Herbert Fox (Ph.D.): Aeronautical Engineering, Urban Technology
*Adrienne O'Brien (Ph.D.): Communication Arts
*Olindo Grossi (M.S.,R.A.): Architecture
John Calicchia (Ph.D.): Psychology
Bernard Gleimer (N.M.E.): Industrial Engineering (Licensed Professional Engineer)
Raymond Havelick (Ph.D.): Psychology
Heskia Heskiaoff (M.S.): Computer Science
Edward Kafrissen (Ph.D.): Electrical Engineering
Chung Lee (Ph.D.): Political Science
Molly Lee (Ph.D.): Economics
Phillip LeBel (Ph.D.): Economics
Eugene Mitaceck (Ph.D.): Chemistry
Lee Morrison (Ph.D.): Communication Arts
D. Rao (Ph.D.): Industrial Engineering
Rifat Tabi (Sc.D.): Mechanical Engineering (Licensed Professional Engineer)
Rajen Tibrewala (Eng.Sc.D.): Operations Research

Marjorie McGovern, *Executive Secretary*

Julea L. L. Olson, *Secretary*

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*Member, Academic Liaison Committee

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Paraprofessionals and Student Associates

**Donald Alberto (B. of Architecture candidate, NYIT)
Daniel Bell (B.A. of Architecture candidate, NYIT)
Anthony Bocchino (B.A. candidate, NYIT): Marketing
Richard Burdick (B. of Architecture candidate, NYIT)
Kenneth Burleson (B.A. candidate, NYIT): Business Administration
Lorenzo Cheek (B.S. candidate, NYIT): Life Sciences
**Donna Chudnoff (B. of Architecture, candidate, NYIT)
**William Collins (B. of Architecture candidate, NYIT)
Tom Coyler (B. of Architecture, candidate, NYIT)
Fred Davis (Volunteer: Sierra Club)
Edward De Rosa (B.S., Manhattan College - Civil Engineering)
Ruth Diamond (Volunteer: Former School Teacher)
Paul Dobsovits (B.A. candidate, NYIT): Business Administration
Bruce Doll (B.S. candidate, NYIT): Computer Services
Vincent Donaghy (B.A. candidate, NYIT) Business Administration
Paul Erdmann (B. of Architecture, NYIT)
Robert Farkas (B.S. candidate, NYIT): Architecture
Daniel Feldman (Senior - Herricks Community High School)
Shawn Fitzpatrick (funded by Comprehensive Employment and Training Act) Nassau County
William Flynn (B.S. candidate, NYIT):Architectual Technology
Gary Frank (B. of Architecture candidate, NYIT)
**Suzanne Giwoyna (B.S. candidate, NYIT): Environmental Science
Robert Gluck (B.A. candidate, NYIT): Marketing
Edward Gold (Volunteer, Nassau County)
Jack Gray (B. of Architecture, NYIT)
**Cynthia Keene (B.S. candidate, NYIT): Business Education
Martin Lapidese (Volunteer, Former Assistant School Principal)
Barry Lawson (B.T. candidate, NYIT): Electrical Engineering
James Leggio (B. of Architecture NYIT): Business Administration
**Lauren Levine (B.S. candidate): Political Science
Joel Liss (B.S. candidate, Hofstra University): Psychology
**Michael Maddalena (B. of Architecture, NYIT)
David Maltz (B.A. candidate, NYIT): Marketing
**David Gorden (B.S. candidate, Yale University): Engineering

**Status changed from volunteer to hourly worker.

-continued-

Paraprofessionals and Student Associates (continued)

David Maltz (B.A. candidate, NYIT): Marketing
Marilyn Mariani (B.A. candidate, NYIT): Business Administration
Sam Martino (B.A. candidate, NYIT): Business Administration
Neal Moran (B.A. candidate, NYIT): Marketing
James Nicklas (B.T. candidate, NYIT): Mechanical Technology
Carol Novello (B.F.A. candidate, NYIT): Communication Arts
**Greg Nowell (B. of Architecture candidate, NYIT):
Robert Pappas (B. of Architecture candidate, NYIT)
**Ricki Polisar (Volunteer: M.A. CUNY): History
Elliot Prawda (B.A., SUNY - Binghamton): Economics
Linda Rosenberg (B.S. candidate, Cornell University)
Richard Ruffner (B.A. candidate, NYIT): Business Administration
Alex Stoeger (B.S. candidate, NYIT): Architecture Technology
Reggie-Ann Silverman (B.A. candidate, NYIT): Marketing
**Shari Silverman (B.S. candidate, NYIT): Science
Richard Strauss (B.A. candidate, NYIT): Marketing
Rachelle Tawil (B.S. candidate, NYU): Environmental Science
Vincent Trice (funded by Comprehensive Employment and Training Act): Nassau County
Pamela Whitehead (B.A. candidate, NYIT): Marketing

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CEPR Policy Advisory Council

Honorable Albert J. Abrams
Director
Northeastern Legislative Energy Project

Mr. Park Adikes
Chairman of the Board
Jamaica Savings Bank

Mr. Frederick R. Bentel, A.I.A.
Bentel and Bentel Architects

Honorable Max Berking
Administrative Coordinator
New York State Legislative Commission on Energy Systems

Mr. Robert Berks
Sculptor and Environmentalist

Mr. Lynn Alan Brooks, Commissioner
Department of Planning and Energy Policy

Edward J. Carlough
President
Sheet Metal Workers International Assoc.

Mr. Fred S. Dubin, P. E.
President
Dubin-Bloome Associates

Mr. Melvin H. Gale
Chairman
The Dartmouth Plan

Mrs. Mary P. Haris
Vice President
Metropolitan Regional Council

Mr. Lee Koppelman
Executive Director
Nassau-Suffolk Regional Planning Board

Mr. Burke Marshall
Professor of Law
Yale Law School

Mr. David G. Moore
Senior Vice-President
The Conference Board

Honorable Richard L. Ottinger
Congressman, New York

Mr. Ronald B. Peterson
Director, Energy Systems
Grumman Aerospace Corporation

Mr. Anthony Providenti
Chairman of the Board
Consolidated Petroleum Terminal, Inc.

Mrs. Lola Redford
Consumer Action Now's Council

Mr. Charles Richman, Director
Division of Energy Planning & Conservation, New Jersey Dept. of Energy

Mr. Arthur Roth
Chairman of the Board
Bank of Suffolk County

Dr. Robert Spillane
Superintendent of Schools
City of New Rochelle

Mr. Donald B. Straus
President
Research Institute
American Arbitration Association

M. Moran Weston, Ph.D.
President
Urban Ventures, Inc.

Ms. Viki List Zelman
Zelman Foundation

Mr. Richard Zirinsky
President
Interboro Realty Company

Publicity Program and Activities

In light of the experimental nature of the Energy Advisory Service and its objective to provide significant data in anticipation of the establishment of a nationwide, state-run Energy Extension Service Program, publicity activities were designed not to obtain maximum number of program users, but rather to monitor the effectiveness of different kinds and locations of publicity, and to facilitate evaluation activities including analysis of the effect that Hot Line answers and Seminar participation had on subsequent knowledge and actions of users.

Under the supervision of the Director, the staff issued new releases to announce the initiation of each program, gave interviews to newspapers (and on a more limited basis to radio and television), sent introductory materials to all organizations participating in the Energy Referral Service, attended energy fairs, distributed flyers through post offices, banks, and libraries, and pursued any available, free advertising.

All known instances of print/electronic coverage of the Energy Advisory Service and its component programs are listed in Table 48, which follows. Selected examples of items appearing in print are provided in the Appendix.

TABLE 48

PRINT AND ELECTRONIC MEDIA COVERAGE

I. Overall Energy Advisory Service and Staff Activities

A. PRINT COVERAGE

"Energy....Extension Services?" CRD Newsletter, (USDA Extension Service), May, 1976.

"Tech to Tell You How to Save Your Energy," New York Sunday News, July 4, 1976.

"N.Y. Tech to Get Center for Energy Information," Newsday, (Long Island daily), July 15, 1976.

"Advisory Service at N.Y. Tech: Three-State Energy Program Planned," Westbury Times and Long Island Forum, Glen Cove Record-Pilot, Roslyn News, Great Neck Record, Manhasset Press and Port Washington News, (New York), September 12, 1976.

"Blackboard," (column), New York Post, August 14, 1976.

"Energy Advisory Service Provides Technical, Consumer Information," Air Conditioning and Refrigeration Business, September, 1976.

"Energy Conference," Long Islander, (Huntington, New York), September 9, 1976.

"Tri-State Energy Advisory Service to be Established at New York Institute of Technology," NYIT Campus Slate, September 28, 1976.

"Energizing Energy Conservation," New York Times, September 26, 1976.

"First Energy Advisory Service Has Been Established at NYIT," NYIT Campus Slate, September 28, 1976.

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"Tri-State Energy Advisory Service to be Established at N.Y. Tech Under Federal Energy Program," The NYIT Scribe, Autumn, '76.

"Waste Not, Want Not: Stopping the Energy Drain," Newsday's Magazine for Long Island, October 24, 1976.

"Energy," National Recreation and Parks Association, October, 1976.

"Study Shows Half U.S. Energy Production is Wasted," Asbury Park Press, (New Jersey daily), November 21, 1976.

"Conservation: America Hasn't Yet Caught On," The Daily Item, The Daily Times, The Standard-Star, The Daily Argus, The Herald Statesman, The Daily News, The Citizen Register, The Reporter Dispatch, The Journal-News and Review-Press and Reporter, November 25, 1976.

"Solar Energy Talk," New Jersey Home News, December 8, 1976.

"Alternative Energy Supplies Focus. of Earth Day Fair," Glen Cove Record-Pilot, April 14, 1977.

"Conservation of Energy is North Hempstead Subject," Manhasset Press, Port Washington News, Great Neck Record, Roslyn News, Manhasset Mail, March 12, 1977.

"Energy Talk at North Hempstead Town Hall," Nassau Illustrated News, March 5, 1977.

"We Can All Beat the High Cost of Energy," Newsday (NYIT CEPR Supplement), June 5, 1977.

"Energy Efficiency," (editorial) Great Neck Record, Manhasset Press, Roslyn News, Port Washington News, Oyster Bay Enterprise-Pilot, June 16, 1977, June 30, 1977.

"Tips for Saving Energy," Glen Cove Record-Pilot, July 7, 1977.

"Energy Conservation Fair in Lake Success," Great Neck Record, June 22, 1977.

"Energy the Topic at Chapter Meeting," Long Island Realtor, November, 1977.

"Energy Center Named Consultant to Government Agency," Tech-Letter, December 22, 1977.

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B. RADIO/TELEVISION COVERAGE

WLIR FM 92.7, "Energy Advisory Service," October 3, 1976, and October 16, 1976.

WRKO "Energy Conservation Talk-In," August 5, 1977.

Newsweek Broadcasting Service, "Energy Reminders," filmed on December 6, 1977, for distribution to 65 television stations across the country.

II. NYIT Energy Information Center/Referral Service/Hot Line Complex

A. PRINT COVERAGE

"Need to Know? Call New York's Energy Hotline," Energy, (AIA Washington Newsletter), September , 1976.

"Hot Line Gives Answers on Energy Conservation," New York Sunday News, October 17, 1976.

"NYIT Energy Hot Line is Open; Will Provide Information on Request," NYIT Campus Slate, October 19, 1976.

"Hot Line Has Answers for Energy Conscious," Campus Slate, October 4, 1977.

"Energy Hot Line," Did You Know? (newsletter of Oil Heat Institute of Long Island) December 16, 1976.

"Special Service," Environmental Education Bulletin, January 1977.

"NYT Energy Hot Line," Federated Conservationists of Westchester County Inc., January, 1977.

"An Energy Hot Line Service," IEEE Spectrum, (Institute of Electrical and Electronics Engineers Magazine) January, 1977.

" - Sky's the Limit, Home's the Target," Sunday Newsday, (special section), January 23, 1977.

"New Phone Number Gives Energy Answers," New Jersey Inquirer, January 1977.

"More on Solar Heating," The Home News (New Brunswick, New Jersey), March 6, 1977.

"Readers Ask Help," Gannett Papers, March 6, 1977.

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"A Vibrant Campus Where Estates Stood," Great Neck Record, March 10, 1977.

"Hot Line Provides Energy Data," National Insulation Contractors Association Magazine, April, 1977.

"Here's How to Save Energy and Cut Those Utility Bills," New York Times, April 28, 1977.

"How to Save Energy and Keep a Sunny Disposition," New York Times, April 28, 1977.

"Energy Hot Line," Marine Midland (Long Island Division of Marine Midland Bank) May, 1977.

"Solar Energy Hot Line," Virginia Energy Office (newsletter), June, 1977.

"Promoters Jump on Insulation Bandwagon," Rochester Labor News, (New York),June, 1977.

"Prices Rise as Promoters Jump on Insulation Bandwagon," Steel Labor, (Pittsburgh), June 1977.

"How to Buy: Promoters Jump on Insulation Bandwagon," The Labor News, Washington, D.C.),June 5, 1977.

"We Can All Beat the High Cost of Energy," Newsday, (NYIT Energy Supplement), June 5, 1977.

"Getting Your Money's Worth," AFL-CIO News, June 12, 1977.

"How to Buy: Prices Rise as Promoters Jump on Insulation Bandwagon," Lorain Labor Leader, (Michigan), June 15, 1977.

"The Energy - Saving Plunge into Solar Heating for Pools," Newsday, August 6, 1977.

"New York Tech Spotlights Continuing Education," Long Island Business Review, August 10, 1977.

"Home Line," Newsday, August 27, 1977.

"Prices Rise as Promoters Jump on Insulation Bandwagon," Plainedge Public Library Consumer Bulletin #42, September, 1977.

"Energy Hot Line," Long Island Realtor, September, 1977.

"Energy Hot Line," The NYIT Campus Slate, September 20, 1977.

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"Hot Line Offering Work Experience," The NYIT Campus Slate, October 4, 1977.

"Hot Line Has Answers for Energy - Conscious," The NYIT Campus Slate, October 4, 1977.

"Heat Pumps," ERDA Fact Sheet, October, 1977.

"Choosing Home Insulation," New York Times, November 10, 1977.

"Suffolk County Department of Consumer Affairs," Energy Task Force Report, November 15, 1977.

"Energy Audit: Insulation Decisions are Not Easy," Winchester Evening Star (Virginia), November 16, 1977.

"Practical Materials for Teaching Energy Management; A Resource File," United States Department of Energy, (Washington D.C.) November, 1977.

"You and Energy," Glen Cove Record, Manhasset Press, Oyster Bay Enterprise - Pilot, Port Washington News, Roslyn News, Westbury Times, (Energy Supplement), December 8, 1977.

"Homeowners Trying New Ways to Beat Winter Cold," New York Times, December 21, 1977.

"Some are Learning to Cope With Insulation 'Crisis'," The Times Herald Record, (Westchester), December 22, 1977.

"Telephone Ties," Energy (National Recreation and Park Association), Issue #9, December, 1977.

"Resources for Energy Information," Cooperative Extension Association, (flyer), December, 1977.

"Energy," Newsday Directory, (Roslyn, Westbury, and Neighboring Communities), 77 - 78.

"Long Island Energy Task Force," Directory, 1977.

"Industrial Energy Conservation: Where Do We Go From Here?" an Inform Report, 1977.

"A Guide to Solar Energy," Solar Age Catalog, 1977.

"Sources of Information on Alternative Energies," National Solar Heating and Cooling Information Center, 1977.

-continued-

"Simple Gadgets That Can Pare Home Fuel Bills," Medical Economics, January 23, 1978.

"A & S Panel on Energy Conservation," Roslyn News, Great Neck Record, Westbury Times, Port Washington News, Glen Cove Record - Pilot, Oyster Bay Enterprise Pilot, January 12, 1978.

"Energy Hot Line," Long Islander, (Huntington, N.Y.), January 12, 1978.

"Solar Hot Lines Listed," Solar Utilization News, Vol. 2, No. 8 February, 1978.

B. RADIO/TELEVISION COVERAGE

WLIX, WBLI, WGLI, "Energy Hot Line," February 6, 1977 and February 27, 1977.

Channel 21, WLIW Television, "Energy Hot Line," January 25, 1977.

WLIX, WBLI, WGLI, "Consumer Outlook," May 29, 1977, and June 14, 1977.

C. OTHER

A word-of-mouth process indicates that the following sources carried printed references:

Montreal Star, February - March, 1977 period.

Newark Star Ledger, (New Jersey), February - March, 1977 period.

Courier News, (New Jersey), February - March, 1977 period.

Bergen Record, (New Jersey), February - March, 1977 period.

Herald Telephone Newsletter, (Indiana), December, 1977 period.

Palm Beach Post Times, (Florida), November 28, 1977 period.

III. Energy Management Seminar Program Including Free-Standing Video Cassettes

A. PRINT COVERAGE

"MRC-TV Guide," Metropolitan Regional Council, November/December, '76.

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"Energy Seminars," Did You Know....? (newsletter of Oil Heat Institute of Long Island), November 18, 1976.

"Energy Conservation Discussed at Seminar," The NYIT Campus Slate, November 23, 1976.

"New York Tech Offers Free Solar Energy Film," Long Island Business Review, March 16, 1977.

"Center for Energy Policy and Research," The Book, (newsletter, Construction Specifications Institute, L.I., N.Y. chapter) March, 1977.

"MRC-TV Guide," Metropolitan Regional Council, June, 1977.

"We Can All Beat the High Cost of Energy," Newsday, (NYIT CEPR Supplement), June 5, 1977.

"Conserving Energy is Seminar Subject," Long Island Business Review, June 15, 1977.

"Latest Info on Energy Readied for Two TV Seminar Sessions," Port Washington News, Glen Cove - Pilot, Roslyn News, Oyster Bay, June 16, 1977.

"Energy Tips Soon," South Bay's Newspaper, (Long Island), June 22, 1977.

B. RADIO/TELEVISION COVERAGE

WINS, WBAI, "Public Service Announcement," June 14, 1977.

C. OTHER

The following business, trade, and professional associations carried announcements:

Associated Builders and Owners of New York City.
Building Supply News Magazine
Home Builders Institute of Long Island
Home Improvement Council of New York
Construction Specifications Institute
Illuminating Engineering Society
Consumer Action Now
Federated Conservationists of Westchester County
League of Women Voters (various chapters)
Sierra Club, New York
Scientists Institute for Public Information
Oil Heat Institute of Long Island

Staff Activities

Staff activities and responsibilities required to establish and implement the Energy Information Center/Referral Service/Hot Line complex and the Energy Management Seminar Program including the spin-off distribution of free-standing video programs have been discussed throughout this report.

For the purposes of publicizing these outreach programs more widely, the staff also provided information, technical assistance, speakers, printed materials, and conference participants for 72 private and public organizations concerned with energy conservation. Table 49, which follows, provides examples of representative activities.

In addition to these staff activities, an experimental Technical Assistance Team Program was begun during the final phase of the initial contract period (January through March 1977). This Program involved training volunteers to assist area homeowners in the completion of the Home Energy Saver's Workbook (FEA), and the Project Retro-tech Home Weatherization Job Book (FEA). These manuals permit the determination of what measures will make a particular home more energy efficient.

Technical Assistance Teams, comprising two to three members under professional supervision, made a total of 31 audits during this period. The availability of the service was publicized by "word-of-mouth" and in one local newsletter. The teams traveled as far as Suffolk and Westchester counties to do audits, but a majority were completed in Nassau County or within a twenty-mile radius of the Center.

Each audit took one to three hours. Time was spent not only to take measurements, but to explain to homeowners about a number of important conservation practices beyond the manuals' coverage and to answer their questions.

Typical questions concerned the value of attic fans, differences among various generic insulation types, reconditioning of furnace, impact of conservation on comfort, pay-back periods, solar feasibility, tax reassessments, and advantages of waiting to take action until the enactment of pending legislation.

Many homeowners were fairly well-informed before the Team visit. Often contractors had already appraised possible retrofit improvements. Homeowners voiced considerable pleasure in receiving an independent opinion and at first had difficulty in comprehending that our audit had no associated "catches."

Illustrative of the success of even this small effort was the fact that by the time the Technical Assistance Team program was ended (in accord with the terms of the ERDA Statement of Work for the extended Energy Advisory Service contract period), many more requests for audits had been received than could possibly be handled.

TABLE 49

PARTIAL LISTING OF NYIT ENERGY ADVISORY SERVICE STAFF ACTIVITIES

Northeast Energy Perspectives Conference, Brookhaven National Laboratory, March 16, 1976 attendants.

Seminar on Energy Legislation Effecting Nassau County, Mineola, New York, March 18, 1976, attendant.

Summer Workshop on Energy Extension Services, University of California at Berkeley, July 19-23, 1976, Presentation of an invited paper "WE CAN SOLVE THE ENERGY CRISIS: The Transfer of Energy Conservation Technology," by E.F. Shelley.

Solar Show of Shows for the Northeast: Solar Energy Conservation Show, Woburn, Massachusetts, July 29, 1976 attendant.

Inauguration of ERDA transportable Solar Laboratory, Westbury, New York, August 12, 1976 attendant.

Suffolk County Conference on Energy Conservation and Development, Hauppauge, New York, September 16, 1976 participant.

Nassau County, Energy Expo '76 exhibition, Lido Beach, New York, September 30 - October 3, 1976.

WLIR FM 92.7, October 3, 1976, and October 16, 1976, interview on Energy Advisory Service.

N.Y. ERDA, Solar Energy Application Center Committee, New York, New York, October 15, 1976 committee member.

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Nassau County-Suffolk County Task Force for Solar Systems and Energy Conservation, Mineola and Hauppauge, New York committee member.

Long Island Advisory Council on Higher Education, Old Westbury, New York, October 21, 1976 guest speaker.

Regional Workshop on Energy Conservation on the College Campus, New York, New York, September 14, 1976 attendant.

G.S.A.--Public Building Service Energy Conservation Conference, Americana Hotel, New York, New York, December 8, 1976 attendant.

Committee for Intermediary Technology of Cook College, Rutgers-State University, New Brunswick, New Jersey, December 9, 1976, guest lecturer.

Channel 21, WLIW television, January 25, 1977, G. Bardige, 6 minute interview on Hot Line with representative of Nassau County Extension Service.

Construction Specifications Institute, Long Island Chapter, January 27, 1977, R. Horrigan, presentation of video-cassette Solar Energy Today and discussion leader.

WGLI AM 1290, WBLX FM 106.1; and WLIX AM 540, February 6, 1977, and February 27, 1977, 15 minute interview on Hot Line.

North Shore Coalition for Safe Energy, Great Neck, Long Island, February 16, 1977, guest speaker.

Committee to Evaluate Appropriate Technology Prospects, State of New Jersey, Department of Community Affairs, Trenton, New Jersey, March 1, 1977 member.

Seminar on Energy Decisions, American Jewish Committee, New York, New York, April 12, 1977 participant.

New York State, Energy Exposition 1977, Albany, New York, April 21 - April 24, 1977 . Exhibitor.

Sea Cliff Energy Fair, Sea Cliff, New York, April 23, 1977 participant.

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Regional Consumer - Homemaking Education Institute, April 28, 1977 panelist.

Suffolk County Consumer Education Committee meeting, Hauppauge, Long Island, May 10, 1977, guest speaker.

North Hempstead Town Ecology Commission, May 19, 1977, guest speaker.

Science Exploration '77, Suffolk County Teachers Association, Dowling College, Oakdale, May 24-25, 1977, Exhibitor.

Westchester County Energy Fair, White Plains, New York, May 28, 1977, provision of materials.

WGLI AM 1290, WBLI FM 106.1, and WLIX AM 540 , May 29, and June 19, 1977, "Consumer Outlook," guest expert.

Sierra Environmental Day Fair, New York, New York, June 4, 1977, Exhibitor.

Nassau County BOCES Agricultural Fair, June 4-5, 1977, provision of materials.

Lake Success Energy Fair, Lake Success, New York, June 27-29, 1977 participants.

Northport/East Northport, (New York), Administrators Workshop, June 29, 1977, guest speaker.

New York Ocean Science Laboratory Exhibit on Energy, Suffolk County, New York, Summer, 1977, provision of materials.

Greater Ridgewood Historical Society Ocktoberfest '77, Queens, N.Y. August, 1977, provision of materials.

Managing the Energy Dilemma, FEA, and American Management Association, Huntington, New York, August 3, 1977, attendant and speaker.

Conference on Energy and Jobs, New York, New York, August 3, 1977, participant.

WRKO, August 5, 1977, Rockland County, New York, 2 hour "Energy Conservation Talk-In," guest expert.

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Bi-County Solar Energy Symposium, Mid Island Plaza, Hicksville, New York, August 12-13, 1977, participant.

National Park Service Energy and Tomorrow Fair, New York, New York, August 13-14, 1977, provision of materials.

Long Island Task Force, monthly meeting, (as of September 1, 1977) member.

Energy Management Workshop, FEA Region II, and SBA, New York, September 1, 1977, attendant.

American Political Science Association, Washington D.C., September 1-2, 1977, attendant and speaker.

Energy Extension Service Orientation Meeting, Washington D.C., September 14-16, 1977, guest speakers.

Long Island Board of Realtors, Roslyn, New York, September 19, 1977, guest speakers.

New Hyde Park 50th Anniversary Fair, New Hyde Park, New York, September 25, 1977, participant.

Floral Park, (New York), North End Civic Association, September 26, 1977, guest speaker.

Nassau County Cooperative Extension Service Energy Conservation Workshop for Senior Citizens, Manhasset, New York, September 26, 1977, participant.

League of Women Voters of South Brookhaven, Bellport, New York, September 28, 1977, guest speaker.

Rockland Community College Energy Conservation and Alternative Energy Expo, October, 1977, provision of materials.

SUN DAY Planning Committee, (New York City), as of October, 1977, member.

SUN DAY Executive Board, (New York City), as of October, 1977, member.

Nassau County, Energy Expo 77, Greenvale, New York, September 29 - October 2, 1977, exhibitor.

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Parksville Library, Great Neck, New York, October 4, 1977, guest speaker.

Fourth Grade Class, Meadowbrook Elementary School, East Meadow, New York, October 20, 1977, guest speaker.

Workshop on Managing Energy Use, Nova University, Fort Lauderdale, Florida, November 16-19, 1977, Workshop leader.

World Environmental Day Planning Committee, New York, New York, December 9, 1977, member.

Long Island Energy Task Force, January 10, 1978, meeting hosted by CEPR.

Energy Extension Service Director's Meeting, Nashville, Tennessee, January 12, 1978, guest lecturers.

Energy Conservation Fair, South Shore Mall, Bay Shore, New York, January 13-15, 1978, exhibitor.

Energy Conservation Symposium, A & S Department Store, Manhasset, New York, January 17, 1978, guest speaker.

Copyright Clearance Center Workshop, New York, New York, January 24, 1978, attendant.

Second National Conference and Exhibition on Technology for Energy Conservation, Albuquerque, New Mexico, January 24-26, 1978, attendant and speaker.

Long Island Solar Conference, Hempstead, New York, February 14, 1978, attendant.

1978 Seminar for High School Teachers of Architectural Courses, NYIT, February 15, 1978, speaker.

External Relations with Other Programs, Agencies and Institutions

A vital part of the Energy Advisory Service was the assistance it could garner from outside groups. The overall operation of the Program benefitted greatly from assistance offered us from two quarters:

(i) Groups identified and contacted during the process of developing and updating the Energy Referral Service roster

(ii) Groups who came forward with unsolicited offers of assistance after experiencing or hearing about a particular energy outreach program.

(i) Program Assistance from Referral Service Groups

When planning began for other outreach programs, the Referral Service roster was reviewed for organizations apt to be interested in offering assistance. This proved to be a useful exercise. For example, each individual who served as an expert or a panelist during the Energy Manangement Seminar Program was drawn from the Referral Service master list. Organizations helping us in this manner were Dubin-Bloome Associates, IBM, Long Island Savings Bank, New York State Energy Office, National Association of Home Builders Research Foundation, ASHRAE, Consumer Action Now, New York City Department of City Planning and the Board of Standards and Appeals, Owens/Corning Fiberglas, Northeastern Solar Energy Works, Parson, Brinckerhoff, Quade and Douglas, Community Services Administration, Blum and Nerzig (Architects), New York State Energy Research and Development Authority, and Illuminating Engineering Society.

Similarly, the Referral Service master list was used to identify groups who might assist in publicizing the New York Tech Energy Hot Line. Groups providing such assistance included National Solar Heating and Cooling Information Center, Brookhaven National Laboratories, U. S. Department of Energy (Region II), Consumers Union, Better Business Bureau, Nassau County Cooperative Extension, Suffolk County Cooperative Extension, Suffolk County Consumer Affairs Department, Long Island Lighting Company, Nassau-Suffolk Regional Planning Board, New England Solar Energy Association, New York State Energy Office, American Hospital Association, New York City Council on the Environment, and Sierra Club.

(ii) Unsolicited Program Assistance

Another important source of outside program assistance came from individuals or groups who experienced or heard about one of our services and then offered their cooperation without any prompting on our part. For example, after the Winter 1976 Energy Management Seminar series, offers to assist in new seminar development were received from the American College of Hospital Administrators, the New York Chapter of ASHRAE, and a number of architects, either privately employed or working for public facilities.

These offers, which were accepted, facilitated the development of the June 1977 seminar program.

Time and Resource Allocations

Total NYIT Energy Advisory Service cost from initiation on June 1, 1976 to expiration on February 28, 1978 amounted to $315,000.

Resources including salaries, overhead, materials and other direct expenses were expended on (a) program start-up activities (four months), (b) the NYIT Energy Information Center, exclusive of acquisitions (c) the NYIT Energy Referral Service, (d) the New York Tech Energy Hot Line, (e) the Winter '76 and Spring '77 Energy Management Seminar series, (f) the Evaluation program, and (g) the Technical Assistance Team program as follows:

Start-up	$ 40,000.00
Energy Information Center	96,000.00
Referral Service	24,000.00
Energy Hot Line	54,000.00
Energy Management Seminar Program	71,700.00
Evaluation Program	26,500.00
Technical Assistance Team Program	2,800.00
	$315,000.00

General Observations and Recommendations

Because the Energy Advisory Service not only had considerable success but was flexible enough to learn from mistakes, we are pleased to provide general observations and recommendations to the many States and groups who are planning energy outreach programs. These comments summarize our best judgments arising from practical experience in operating the NYIT Energy Advisory Service for twenty-one months.

(i) The NYIT Energy Information Center/Referral Service/Hot Line Complex

The New York Tech Energy Hot Line provided information and technical assistance to homeowner/consumers and various technical and professional leaders. Considering its impact on homeowners alone, a 1:11 cost-to-savings ratio was calculated. In light of this finding, we strongly believe that other outreach programs should consider providing homeowners/consumers with a similar service.

To bring this service to homeowners required the backup facilities of the Energy Information Center/Referral Service to establish and update Question and Answer material, to locate pertinent reading materials for mailings, and to research inquiries in cases where Question and Answer materials were not adequate.

Also required was the physical presence of a professional staff knowledgable, in particular, in engineering matters. We found that it was more efficient and effective to have an engineer take technical questions directly rather than second-hand through Hot Line operators who cannot be expected to be well enough versed in the language to either comprehend such questions fully or ascertain pertinent background facts necessary to fashioning a satisfactory response.

Having student volunteers staff the Hot Line gave the service tremendous leverage. However, smooth running operations depend on a staff who will reliably work agreed-upon hours. Student volunteers, *while excellent on all other counts*, could not be depended on in this regard. Therefore, starting in Fall 1977, we experimented with paying students minimum wages for their service. This procedure alleviated the problem somewhat, but not entirely particularly during examination periods. Then good students--for pay or not--will devote themselves full force to studying. This being the case, we would advise any outreach program to take special pains both to include students in planning and implementation, and to involve a nonstudent population (including professional volunteers and senior citizens) in the program.

While complaints about the Hot Line service were minimal, nothing distressed users more than to wait two or three weeks to receive promised materials. Therefore, we emphasize the importance of having printed materials, promised over the phone, in continual sufficient supply, and mailed out without delay preferably by first class mail.

The New York Tech Energy Hot Line was designed to service not only homeowners/consumers, but various types of professional and technical leaders as well. Based on data reported in Section Four where a comparative analysis was mounted to determine the relative effectiveness with which the Hot Line and Energy Management Seminar Program transferred energy technology to such professionals, we strongly recommend that this practice continue. In a culture where most people have come to rely on rapid, verbal communications to provide them with the information they need to make their decisions, a telephone Hot Line service is a most satisfactory medium for providing technical and professional leaders with prompt answers to specific and complex questions.

The Energy Information Center/Referral Service, which backed up the Hot Line and was responsible for handling more extensive research needs, benefitted from the availability of the NYIT TECHSEARCH facility through which major data bases in the U. S. could be accessed. However, other Hot Line programs might find their operating needs served equally as well by establishing electronic interconnections with facilities that already have computerized search systems in place.

Finally, we are convinced that wide spread residential and professional usage of a Hot Line service depends on an effective publicity program. It may also benefit from availability of a toll-free telephone number. The publicity program for the New York Tech Energy Hot Line was on a small scale out of deference to its modest funding, its local telephone number, its experimental nature, and the needs of a rigorous evaluation program. Nevertheless, we learned from experience that any reference to the Hot Line in the print media generated immediate, although unsustained, response. Therefore, some method must be devised for providing the Hot Line service with a source of continuous publicity. For homeowners, this might include establishing cooperative arrangements with local newspapers to run a weekly Question and Answer Energy column whose tag line would read, "For more information, call the _______ Energy Hot Line." Furthermore, according to telephone company personnel responsible for coordinating the installation of general service telephone lines, radio and television spots are effective means of advertising a telephone number and can be carried over the airwaves as part of Public Service Announcements.

(ii) Energy Management Seminar Program

The Energy Management Seminar Program consisted of two series of interactive television seminars for professional and technical leaders. The seminars, which numbered sixteen in all, were offered in cooperation with the Metropolitan Regional Council whose television network (MRC-TV) was utilized. Seminars were broadcast from the MRC headquarters studio in the World Trade Center, Manhattan, and were received in eight regional studios in New York, New Jersey and Connecticut. All participants could see hear each other and national experts in this interactive television system and they could do so with minimal inconvenience by traveling to a nearby studio. We learned from experience and a rigorous evaluation program that interactive television seminars are a valuable and inexpensive way of reaching large numbers of professionals, but that substantial lead time must be alloted to organize the attendance of specialized audiences through their appropriate business, professional and trade associations.

On this basis, we would recommend that interactive television seminars on various energy conservation topics be conducted throughout designated geographic areas at sites which permit audio/video or at least audio feedback by seminar participants. Areas in which television systems similar to MRC are not available can still be sites for interactive seminars. This can be accomplished as follows:

> --At designated sites (for example, schools buildings, local hotels), a television receiver and camera could be set up. Arrangements with the telephone company could be made to provide wide-band service to operate the video equipment and put all seminar participants, regardless of site location, in audio and visual contact with each other.

--UHF stations in a designated geographic area could be asked to simultaneously carry the seminar. At designated sites, there could be a regular television set turned to the UHF station along with a telephone conference hook-up for audio participation by seminar attendees.

In the particular interactive television seminars we offered, the key format decision was that each seminar should consist of a combination of previously prepared videotaped interviews with leading energy authorities in addition to live discussions with the participation of expert panelists and members of the audience. By having significant portions of each seminar on videotape, it was possible for the views of national authorities at once to be pared down (through editing) thus maximizing informational content; and to reach (through rebroadcast) a larger number of professionals both in the seminar setting and in private showings before professional, trade and business associations upon request.

With these advantages in mind , we recommend this format to others, but caution planners on the one hand to expect substantial production costs to insure the development of high quality videotaped materials designed for specialized professional audiences; and on the other hand to begin taping video segments well in advance in order to avoid situations where national experts become unavailable due to unanticipated and pressing developments.

A related format decision involved the design of each seminar to appeal to a variety of professional audience types: namely, architects, engineers, contractors, business persons, facility operators, bankers and public officials. This decision reflected our belief that energy conservation is a "systems problem" involving the emergence of supportive and interrelated activities on the part of a variety of technical and professional leaders. According to this view, commitment to conservation would be facilitated among, for example, architects only if supportive actions begin almost concurrently among engineers, bankers and public officials.

Therefore the seminar series were designed to allow all parties involved in this "systems problem" to learn first hand from each other the likely incentives and barriers to conservation within and across professions. To accomplish this objective, the interest and attention of the entire audience could not be permitted to flag. This in turn necessitated some sacrifice in the depth of technical information provided to any one particular audience type.

In light of the importance of combatting the "systems" barrier to energy conservation, we believe that this trade-off was justified. However, other planners of interactive television seminars might decide to develop more technically-oriented presentations tailored to specific professional needs and interests--an activity which we would also endorse. But for those who wish to follow our course, we believe that one way of compensating for any loss in technical depth is to provide seminar participants with detailed supplemental written materials and references prior and subsequent to attendance.

(iii) Cooperating Organizations

As our last observation we would suggest that maximum effort should be made to encourage assistance from and cooperation with other programs, agencies and institutions involved in energy conservation. In our experience, cooperation with such outside groups enormously increased the leverage of the NYIT Energy Advisory Service and helped to accelerate the adoption of more energy efficient practices, technologies and investments by our target audiences.

SECTION SIX

FORMAL RECOMMENDATIONS

Although our findings and observations have been extensively detailed and documented in this report, our formal recommendations may be summarized briefly as follows:

1. Since the Energy Information Center/Referral Service/ Hot Line complex has proved very effective in providing useful and credible conservation information and stimulating energy conserving investment by both homeowners and professionals, we recommend the establishment of similar service complexes in every state or region of the country.

2. Since the Interactive Television Seminar format has proved both popular and effective in sensitizing professionals to the possibilities for economic application of energy conservation technology and in stimulating the increased incorporation of energy conservation concepts in their thinking and their activities as leaders and decision-makers, we recommend the broad establishment of Interactive Television Seminar programs similar to those which we conducted, and utilizing locally available facilities for video dissemination of seminar material and either video (television) or audio (telephone) feedback for discussion purposes.

3. We believe that the various channels of communication described in this report owe their value and their cost-effectiveness not only to the basic concepts involved but to the particular details of organization and operation adopted, and to the quality of the personnel who operate the program. We therefore recommend that in the establishment of similar channels of outreach communication, serious attention be devoted to the specific elements of organization and operation outlined in this report, and to the qualifications, capabilities, training and motivation of the operating personnel involved.

4. The organization and operating experience detailed in this report can be used to good advantage by the 50 State Energy Extension Services now being formulated. Therefore, we recommend that this report be reproduced by the Government Printing Office and made available to appropriate energy officials at the State and Federal level.

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